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iPad Pro
The beginning of the end for the traditional laptop?

Apple TV
A black box that will rock the market

Wizard
vs Muggles

Satechi Gamepad | BrydgeMini Keyboard | Truly magical?

Dear Steve,

This year was busy in terms of new releases of Apple products. We got the brand new 12-inch Retina MacBook and Apple Watch, Apple Music, the new iPhone 6s and 6s Plus, the fourth-generation Apple TV and finally the new iPad Pro. I haven't even mentioned the newest iterations of iOS and OS X, the 21.5-inch iMac 4K and refreshed iPod touch.

There are plenty of new products that extend Apple's ecosystem and make it more complete. If there are any gaps in the product categories Apple offers, the must be even more narrower that they were before. There are a wide selection of Macs, iPads and even iPhones, together with a growing selection of games and apps for the new Apple TV, that should suit every possible customer and let them stay with Apple products and prevent them from leaving the walled garden of miracles.

Over two years ago, during the keynote opening WWDC 2013, Phil Schiller said something that was widely taken with laughter — "Can't innovate anymore, my ass!". In fact, it was an expression of a possible problem that Apple will face sooner or later. Where is Apple going, and what kind of new products they have in their pipeline?

Steve, you have been watching Apple much longer than I do. What do you think about it?

Krystian

Hey, Krystian!

I have to agree with you — it's been a remarkably busy year for Apple, and I've been watching the company since the late 1970s! As busy a year as it has been for Apple, it's been hard on the wallets of those of us who love the company's products.

Where can the company go from here? Well, we know that Apple has an electric car project called "Titan" that can take the company into a completely different market than it has ever seen before, possibly as soon as 2019 or 2020. I'd personally like to see the company get into the robotics business, as I think the company could make some incredible inroads into quality home and business robots that would be far beyond everything that we've seen so far.

But the biggest growth market for Apple in the near term is definitely in services like the App Stores, iCloud, Apple Music, and so on. Those services are the icing on the Apple product cake, and they're an increasingly large percentage of Apple's revenues.

In the long run, Apple really needs to continue to keep its focus on quality, ease of use, and design, and anything it brings to market will be successful. I can't wait to see what the company will unveil in 2016!

Steve

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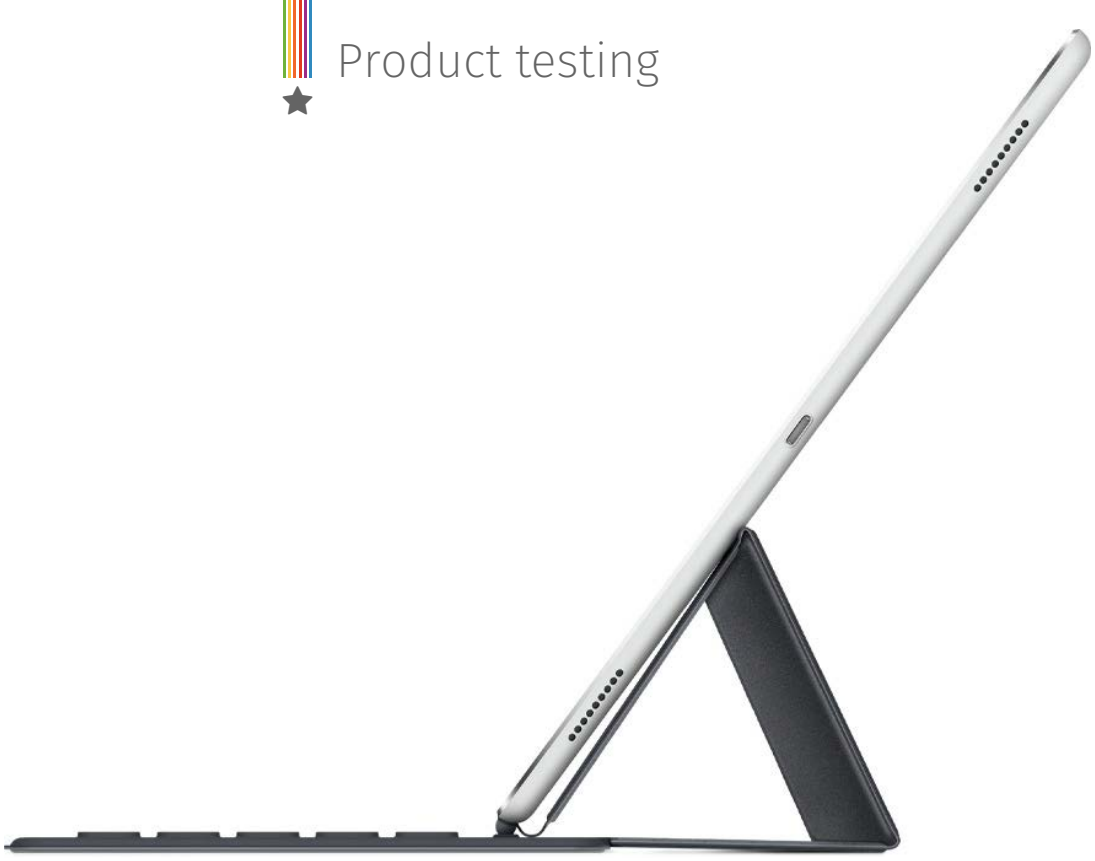
The iPad Pro:

The beginning of the end for the traditional laptop?

Steve Sande

By the time you read this article, there's a good possibility that the newest member of the iPad family — the iPad Pro — will be in the hands of a number of Apple fans including myself. In my case, I plan on reducing the total number of Apple devices in my office by one. The iPad Pro will replace a relatively new 12-inch Retina display MacBook and an iPad Air 2. Now, there's a lot of debate over what exactly the iPad Pro is and whether this is the first step in the direction of replacing traditional laptop computers. After giving it some thought, I came up with some reasons why it's likely that the iPad Pro and similar devices like Microsoft's Surface 4 and Surface Pro are the first wave of the next direction of computing.



Laptops Rule

Apple's most popular Macs are laptops. The MacBook, MacBook Air, and MacBook Pro are all perennial bestsellers, and for many people one of these devices is the only computer they own. It's the same way in the PC world; it's rare to see companies buying desktop computers now, since laptops make it possible for employees to work almost anywhere.

That's not to say that desktop Macs aren't popular; the iMac, Mac mini, and Mac Pro all have their proponents, and this article is being written on a 27-inch Retina 5K iMac. But can I bring an iMac with me to the local coffee shop if I want to get out of the office for a change of pace, or take it on a trip? Unlikely, so laptops rule for mobile work... so far.

> ... the iPad is used for four primary purposes — off-site writing, browsing websites and social media, games, and reading.

Tablets Have Their Place

One odd thing about the iPad is that sales of it, as well as other tablets, have fallen over the past few years. That's in direct opposition to the iPhone, which continues to climb in popularity with no end in sight. Mac sales have actually increased as well, countering the trend of sagging sales that's plaguing the rest of the PC industry. So why are tablet sales falling right now?

When I think about the primary use cases for my iPad Air 2 and for my iMac, the iPad is used for four primary purposes — off-site writing, browsing websites and social media, games, and reading. Yes, oddly enough, I find the iPad to be a really decent writing machine as long as I have a keyboard with me. Fortunately, a lot of accessory manufacturers (Logitech, Belkin, ClamCase, etc...) make really great keyboards that work well with the iPad, and I've found it to be a great device to use for writing.

Earlier in the year I made the decision to buy a 12-inch Retina MacBook for two reasons — it has a great screen and I wanted something with a bit more storage than my iPad so that I could back up photos onto it while

traveling. I found myself doing two things while on an extended trip in June and July. First, I was constantly tapping on the screen of the MacBook trying to move cursors or windows, and second, about the only time I was doing any writing on the trip, it was getting done on the iPad.

So yes, tablets have their place in the market, and if I'm right in my assumption, I think the iPad Pro is going to jumpstart sales of the devices by further blurring the lines between laptop and tablet.

> Sure, Photos is weak in some areas, but the wide variety of apps available to work on photos is making the iPad a formidable photo editing tool.

Why aren't tablets selling that well? Probably a handful of reasons, but some quick ones I can think of are that most that have been created so far are still in use (five years, c'mon!) and don't need to be replaced yet and a lot of people just might not be aware of all they can do on a tablet. The latter could be easily fixed by Apple showing just what can be done on the iPad Pro.

What can't you do on a tablet?

At this point, there are certain situations where a Mac or PC is absolutely a necessity. For example, I find that I need a 27-inch screen to be able to keep a number of windows open simultaneously or switch cleanly and quickly between them. Most tablets at this time don't have the power to do video editing — more on that later. But at this point five years into the life cycle of the iPad, there are apps that can do just about anything you want on a tablet.

Think of productivity apps. For the vast majority of people, and I mean most of those who work in many of the businesses in our world, Pages, Numbers and Keynote (or Word, Excel, and PowerPoint), are perfectly capable apps. Those apps aren't for the small percentage of people who need to do "power work" (think of huge pivot tables and data analysis in the Mac or PC versions of Excel), but that's why Macs and PCs will never go away.

Another case: there's no way to set up virtual machines on an iPad (yet). For bloggers and developers, the ability to use virtual machines running a variety of operating systems — sometimes in beta — it not just a nice thing to have, it's a necessity.

For a writer and blogger, it's nice to see that there are people like Federico Viticci (MacStories.net) who do all of their work on the iPad. I still find myself going to the iMac to do most of my writing, but wonder if the larger screen of the iPad Pro -- with the ability to use two full-size iPad apps in portrait mode side by side -- will change my tune.

How about apps for creative professionals? I don't claim to know much about this area, but go out and do a search on the iOS App Store for "Adobe". You'll find that there are a ton of apps that one company has created specifically for iPad for creatives. That's just one company.

Even Apple's Photos app seems to be getting more powerful on the iPad. The iOS and Mac versions are surprisingly alike, even

to the point that both platforms can now use extensions from other apps to add editing power to the Photos app. Sure, Photos is weak in some areas, but the wide variety of apps available to work on photos is making the iPad a formidable photo editing tool. And it has something built-in that is an add-on to every Mac; a stylus or finger based interface for fine control while working on photos.

Now, talking about video editing... A professional probably isn't going to shoot a full-length feature film in 4K on an iPhone 6s and edit it in iMovie on an iPad Pro, but they could. The iPad platform still needs apps like Motion, Logic Pro, and Compressor to turn it into a pro video platform, but remember that we're still only five years into the iPad lifecycle. I'd love to see one a reader of MyApple Magazine be the first to win the Palm d'Or at Cannes or an Oscar for a movie edited on the iPad...

Advantages of the iPad Pro

The device isn't out yet, but there's a lot we can extrapolate about the iPad Pro given what can be done with the regular iPad. That being said, there are a number of advantages for the iPad platform.

First, as I alluded to earlier, the device has a built-in digitizer. Whether you're using your finger as a broad brush or an Apple Pencil for fine, pressure-sensitive control, the digitizer is always there. That may not necessarily be an advantage for productivity apps. With creative apps, it's likely to be a big selling point for the iPad Pro.

One other big point about the Apple Pencil/iPad Pro combo — most early reviews say that it has almost perfect palm rejection. What does that mean? Most existing apps and styluses have an issue where placing your

hand on the tablet screen to write can cause the screen to think that your palm is a stylus or finger. Ooops. That appears to be a non-issue with the Pencil and iPad Pro.

It's light and thin, but so is the 12-inch MacBook. The iPad Pro weighs 1.57 pounds; add in the Smart Keyboard (.96 lbs) and the entire package is 2.53 lbs. That's exactly a half-pound heavier than the MacBook.

Next, the A9X system-on-a-chip in the iPad Pro is no slouch. Add in the M9 motion co-processor — which can also be used as a full-time Siri monitor even while the Pro is asleep — and you've got a powerful duo.

It's light and thin, but so is the 12-inch MacBook. The iPad Pro weighs 1.57 pounds; add in the Smart Keyboard (.96 lbs) and the entire package is 2.53 lbs. That's exactly a half-pound heavier than the MacBook. The screen of the iPad Pro is .9 inches larger diagonally. Resolution-wise, the iPad Pro measures in at 2732 x 2048 at 264 pixels per inch; the MacBook is 2304 x 1440 at 226 pixels per inch. Both are Retina displays, but the iPad Pro packs 2,277,376 more pixels. Both have just one port; the iPad Pro uses the well-represented Lightning port, while the MacBook -- unlike any other product in Apple's stable -- uses the USB-C connector. Of course, the 12-inch MacBook isn't the only Retina MacBook in the Apple line and the MacBook Pro models have many ports, but I'm trying to compare the closest equivalent to the iPad Pro.

The bigger screen, though, is the main reason I think that the iPad Pro might jumpstart tablet sales and start cannibalizing sales of some of the smaller MacBook models (12-inch MacBook, 11- and 13-inch MacBook Air). One constant irritant for me when working on the iPad in the past has been the need to switch between apps. Split-screen in iOS 9 has made that less of an issue, when I have apps that support the feature. But with the iPad Pro, I will finally have two full iPad screens side-by-side, making it much more useful to multitask.

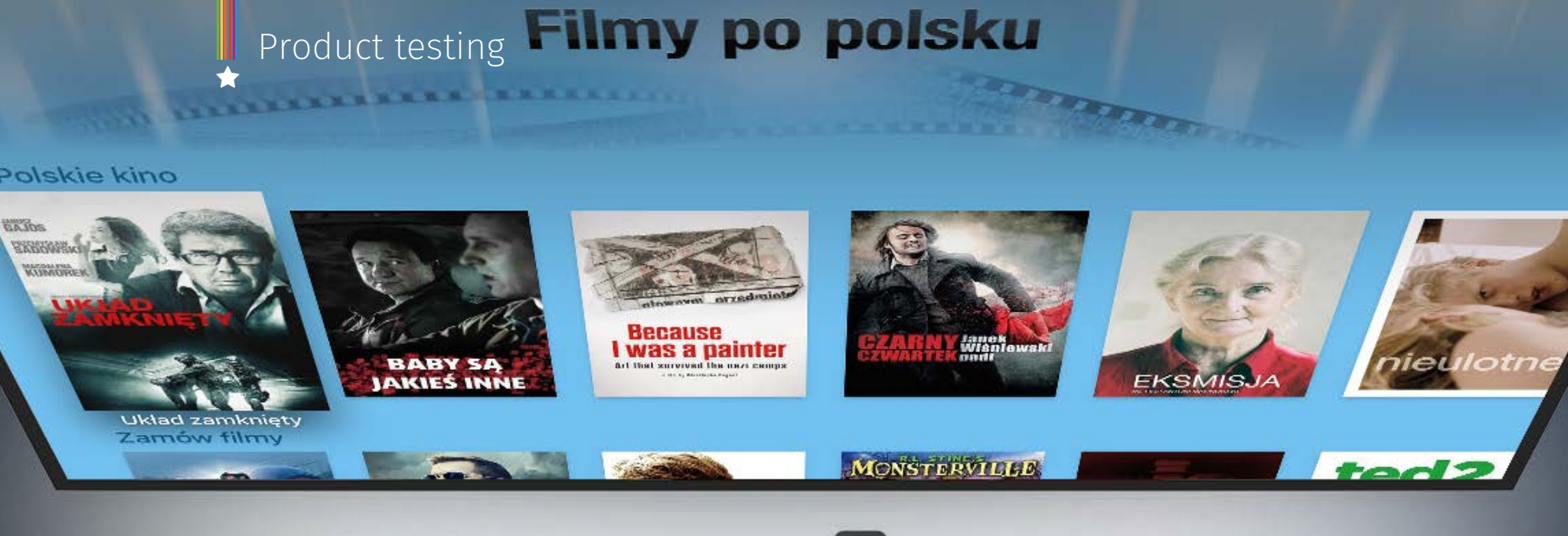
Finally, let's look at a price comparison. Maxing out storage on the iPad Pro at 128GB, equipping it with a Smart Keyboard, and adding a cellular modem (something I can't get built into any MacBook) for out-of-office use would cost $1,248 plus tax. The base MacBook with 256GB of storage runs $1,299 plus tax. Price-wise, it's a wash.

For someone like myself who previously needed a laptop for working offside and a tablet for comfortable and mobile reading, writing and gaming, having everything in one device is going to make life a bit less expensive. Rather than two devices with a total price tag of over $2,028, there's just one device that's about $800 less.

Conclusion

The big question still remains: will the iPad Pro rejuvenate sales of tablets? We're sure to find out over the next three to six months as it becomes clear just how popular the device is to consumers and enterprise. For this writer, though, the decision has been made. I've bought my last laptop.

Photos: Apple



Apple TV
- a black box that will rock the market

Krystian Kozerawski

Of all of this year's Apple product premieres, I was anticipating the 4th generation of its set-top box the most. I wasn't as excited waiting for an Apple Watch or the new iPhones as I was for the Apple TV, despite sacrificing a lot of time and energy to travel from Poland to Berlin to get the Watch and iPhone -- including getting ticketed by German police for parking my car in the wrong place. Even the launch of the Apple Music streaming service lost to the presentation and release of Apple's slightly thicker black box.

To be honest, I had been waiting for the new Apple TV for well over a year. All that time I was counting the days, hours and minutes to every Apple presentation of new devices and services, hoping that each time Tim Cook would unveil the newest version of the device. It took a while, but I lived to see it happen.

For over a week now the Apple TV has been sitting next to my TV. Despite the fact that there is more evolution than revolution in it, it's the new features that define the value of this device.

> When I look at both the 4th generation Apple TV and the latest Time Capsule side by side, I'm reminded of last year's rumors that the new Apple TV would also be an AirPort WiFi router. Who knows, maybe that wasn't a stupid idea.

What's inside of the black box?

In terms of looks, the differences aren't big, but they are important. From above, the new Apple TV looks identical to the past two generations -- a black box with curved corners. There's still a white LED indicating that the device is on and working. The new Apple TV is thicker than the previous models, indicative of more sophisticated internals.

Compared to the 2nd and 3rd generations, the ports on the back of the device are different. In addition to the power cable, HDMI and Ethernet ports, there is a USB-C port for service reasons. Through that port the new Apple TV can be connected to a Mac for recording gameplay with QuickTime or taking screenshots through Xcode (that's what I did for this review).

The new box has no optical audio output, which has been somewhat controversial. Many modern receivers are equipped with HDMI ports and can be plugged in between the Apple TV and the TV itself.

The new Apple TV can communicate via WiFi, but I plug it into my Time Capsule with a cable. I do this not only because both devices are right next to each other, but because I also sometimes experience WiFi hiccups and a wired connection seems to be more reliable.

There are some complaints about the lack of 4K support. The new Apple TV can display only in 1080p. Well, for me, 1080p is enough and I'm not planning on upgrading my TV to 4K in the near future.

When I look at both the 4th generation Apple TV and the latest Time Capsule side by side, I'm reminded of last year's rumors that the new Apple TV would also be an AirPort WiFi router. Who knows, maybe that wasn't a stupid idea. However, Apple would have had to prepare at least two more special hybrid versions of it. Multiplying products is not in Apple's DNA since it was almost bankrupted in the mid-1990s by providing dozens of Mac versions that nobody wanted.

Despite the fact that the A8 processor is one year old, it's a huge quality leap for the Apple TV. The A8 is the heart of the iPhone 6 and 6 Plus, as well as the iPad Air 2 and iPad mini 4. It's strong enough to handle the latest games available in the App Store, displayed on a HDTV. There are some complaints about the lack of 4K support. The new Apple TV can display only in 1080p. Well, for me, 1080p is enough and I'm not planning on upgrading my TV to 4K in the near future. I suspect that most users will also be fine with 1080p.

Siri Remote

Compared to the previous generations of Apple TV, the most noticeable upgrade is the new remote conrol. It communicates with the Apple TV via Bluetooth, but there's also an infrared emitter that can be handy when plugging the Apple TV to a relatively old TV. With the new remote, once can adjust the sound volume on the TV. Since newer TVs communicate with the Apple TV via HDMI, there is no need to even point the remote toward the TV to adjust the sound. As with other new Apple accessories, the new remote control is equipped with a rechargeable battery that can be charged via the Lightning port with a provided cable. Depending on the country and the availability of Siri, it's either called the Siri Remote or just the Apple TV Remote. Here in Poland, Siri isn't available on Apple TV although the remote has a microphone and a special Siri button. In many other countries, pressing the button activates Siri, and one can speak to the remote. Well, not in Poland -- here, pressing that button activates the Search app on the Apple TV.

The Menu button works the same way it did before, taking one back to a previous view or menu level. There's a new Home button that works identically in function to the one on the iPhone or iPad. Clicking the Home button brings back the home screen or -- when double-clicked -- shows the app switcher. The latter view looks pretty much the same as the app switcher in iOS 8. Swiping left or right on the small built-in trackpad lets the user navigate between the apps. Swiping up on an app kills it.

> … the old Apple Remote controls work with the new Apple TV. I have the aluminum remote on my desk and sometimes I pick it up and use it by mistake. It works the same as it does on the older Apple TVs.

The built-in trackpad provides easy and seamless navigation in most situations. Clicking it works like tapping on the screen of an iOS device or clicking the trackpad on a Mac. If you need to accept a choice or open an app, you select it, then press the trackpad. In some cases using the built-in trackpad reminds me of using the Remote app on my iPhone. Sadly, that Remote app doesn't support the new Apple TV.

The built-in trackpad is a near-perfect solution for watching films If you want to move forward or back to a desired scene, you tap the trackpad to show the timeline, then scrub left or right. In previous generations, this operation was neither seamless nor intuitive.

Sadly, the trackpad is made of glass that can be broken. While it's not easy to do so, it is possible. A photo of a Siri Remote with a shattered trackpad made the rounds of tech blogs a week ago. It doesn't sound good; remotes tend to fall from tables or armchairs down to the floor, and I don't think the Siri Remote will be an exception to the rule.

The Siri Remote can also be used as a simple gamepad for games installed on the Apple TV. In those cases, the game shows a simple sketch showing how to use it. Despite Apple requiring game developers to provide full control via the Siri Remote, using it in games is often more pain than fun. I'd suggest considering the purchase of a proper game controller. I personally use the Steelseries Nimbus.

Apple lets users grab an iPhone for fast WiFi and account setup, yet limits the user of the iPhone by not updating the Remote app. I'm hoping Apple will soon update that app for the 4th generation Apple TV.

It's worth mentioning that the old Apple Remote controls work with the new Apple TV. I have the aluminum remote on my desk and sometimes I pick it up and use it by mistake. It works the same as it does on the older Apple TVs.

Setting it up

When every Apple device is turned on for the very first time, it needs to be set up. Usually it's not a big deal, but logins and passwords need to be typed in. In the case of the new Apple TV, this process is even more seamless and easy. The Apple TV only needs to be logged into the local WiFi network unless it's connected to the router with an Ethernet cable, and then the language and national settings must be chosen. Next, tvOS asks the user to choose a further way to add other settings including the iCloud and iTunes Store accounts. Those can be typed in manually, but there's an easier way. Moving an iPhone (with Bluetooth turned on) closer to the Apple TV copies all those settings wirelessly. However, the account passwords still need to be typed in manually afterwards.

While I was typing in the long passwords that had been randomly created by 1Password, I was painfully aware of the lack of support for the iOS Remote app on the new Apple TV. It not only provides trackpad-like gesture control, but also an onscreen iOS keyboard. That keyboard is a very handy tool when logging in or typing keywords into a search form.

However, typing passwords or keywords on the new Apple TV is much less easy. You have to navigate with the trackpad through gestures, moving through the alphabet in one line with the "space" bar on the left end and backspace/delete on the right end, and that just doesn't work well. It's odd that Apple lets users grab an iPhone for fast WiFi and account setup, yet limits the user of the iPhone by not updating the Remote app. I'm hoping Apple will soon update that app for the 4th generation Apple TV.

iTunes Store Video on demand

The primary aim of all of the previous Apple TV models was to provide a video on demand service letting users rent movies from the iTunes Store. For a few years, even users in Poland have been able to rent them. I bought my 3rd generation Apple TV mostly because of that service, and I spent a lot of money renting films. However, neither being able to buy films on Apple TV nor having direct access to the films I purchased

on my Mac was irritating. Of course, I can share my Mac's iTunes library with the Apple TV, but this isn't a seamless solution. My boys can't watch their favorite movies like Big Hero 6, Cars, Planes, Monsters Inc., Despicable Me and Toy Story while I'm away. Moreover, I have to keep those films on a disk — iTunes in the Cloud just isn't working with movies here in Poland.

> ... I had the unpleasant surprise of finding that there was no Movies app. I also found out that users in some other non-English speaking countries were seeing the same thing, and people were wondering if Apple had killed video on demand for smaller markets.

I was hoping that situation would change here with the release of the new Apple TV. Unfortunately, the first time I turned on my new Apple TV for the first time I had the unpleasant surprise of finding that there was no Movies app. All Polish users of the new Apple TV were reporting the same lack of the app, so it wasn't just me. I also found out that users in some other non-English speaking countries were seeing the same thing, and people were wondering if Apple had killed video on demand for smaller markets.

A day later, the Movies app came back to all of the new Apple TVs in Poland, but users could only see the movie poster images. Apparently there was a bug, but also a light at the end of the tunnel. Inside the Movies app I could see a tab for "Purchased" content, which made me hopeful that things were about to get back to normal. Sadly that hope was dashed... Apple solved that problem, and in Poland we can only rent films — a situation similar to what we found on previous generations of the Apple TV. The "Purchased" tab was replaced with a "Rented" one.

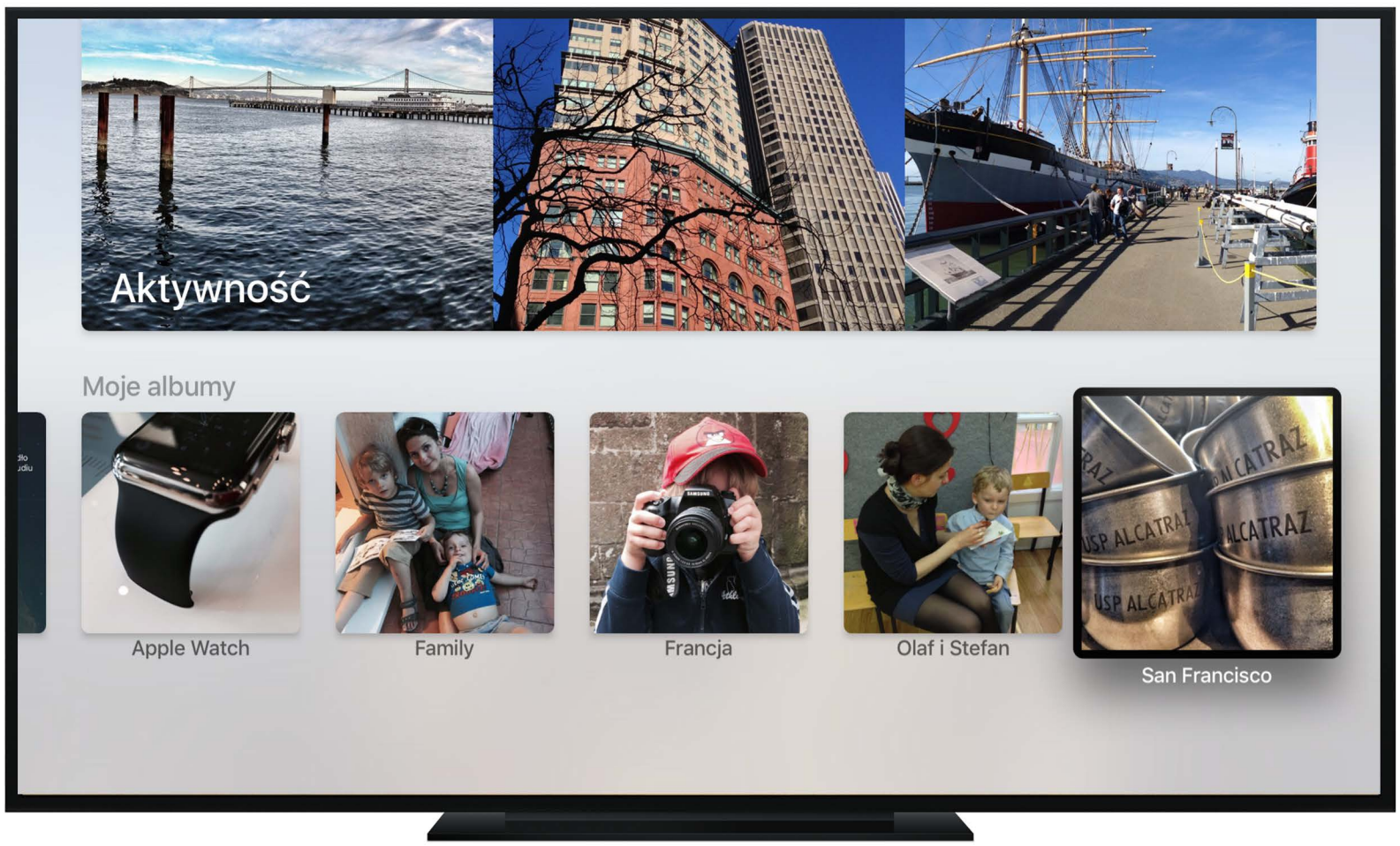
So once again, those movies that my kids love to watch quite often are on my Mac, and my Apple TV is bound to the Mac to get the content.

> I was hoping that a special tvOS version of the Photos app would even let users edit their photos the way they can on the iPhone, iPad and Mac. Sadly, those wishes were in vain as well. The 4th generation Apple TV only provides access to the main “My Photo Stream” and shared streams, not to the full library.

The new Apple TV does allow users to install apps, and developers are busy writing apps for tvOS. Eventually, that will give users access to even more interesting content. American users can enjoy Netflix (still not available in Poland), and there are also national productions like TV series and documentaries. There’s even an app provided by the National Film Board of Canada that provides access to many interesting documentaries — you should watch the one about the popular Canadian rock band Rush! Personally, I’m waiting for the appearance of Apple TV versions of the Polish TV channel apps that are available on iPhone and iPad.

Photos

While I was waiting for the new Apple TV, I hoped for access to my entire Photos library. I am a dedicated user of Photos, putting all of the photos I’ve ever taken (even those taken with an old Soviet Zenith SLR in the 1980s and 1990s) in the cloud. I was hoping that a special tvOS version of the Photos



app would even let users edit their photos the way they can on the iPhone, iPad and Mac. Sadly, those wishes were in vain as well.

The 4th generation Apple TV only provides access to the main “My Photo Stream” and shared streams, not to the full library. There’s also no editing capability. All in all, it’s much less than I expected.

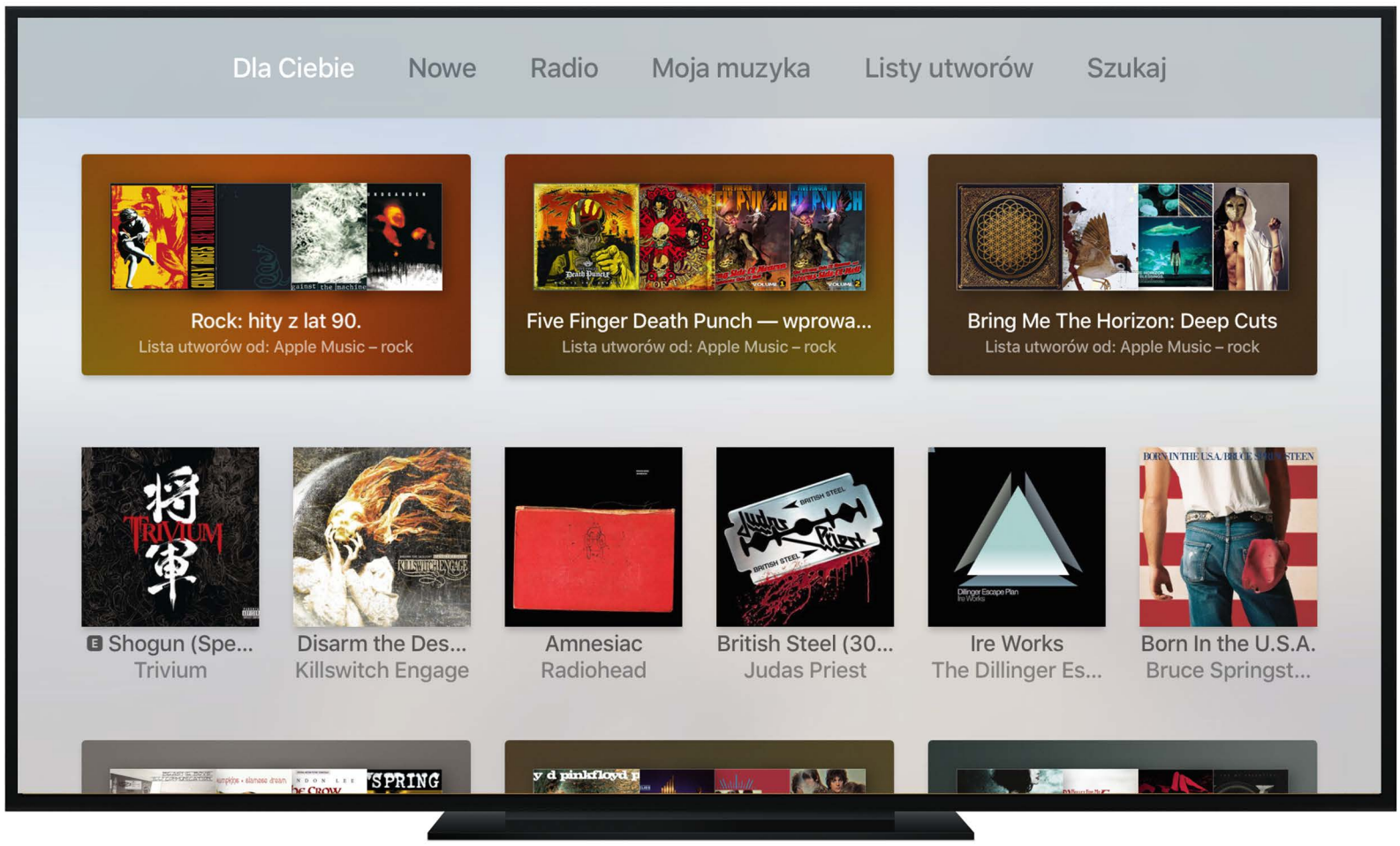
> … music seems to sound better with the addition of moving pictures, especially the new live screen savers. Want to have fun? Play the “Blade Runner” soundtrack by Vangelis and turn on the screen saver with a nighttime panorama of San Francisco or New York.

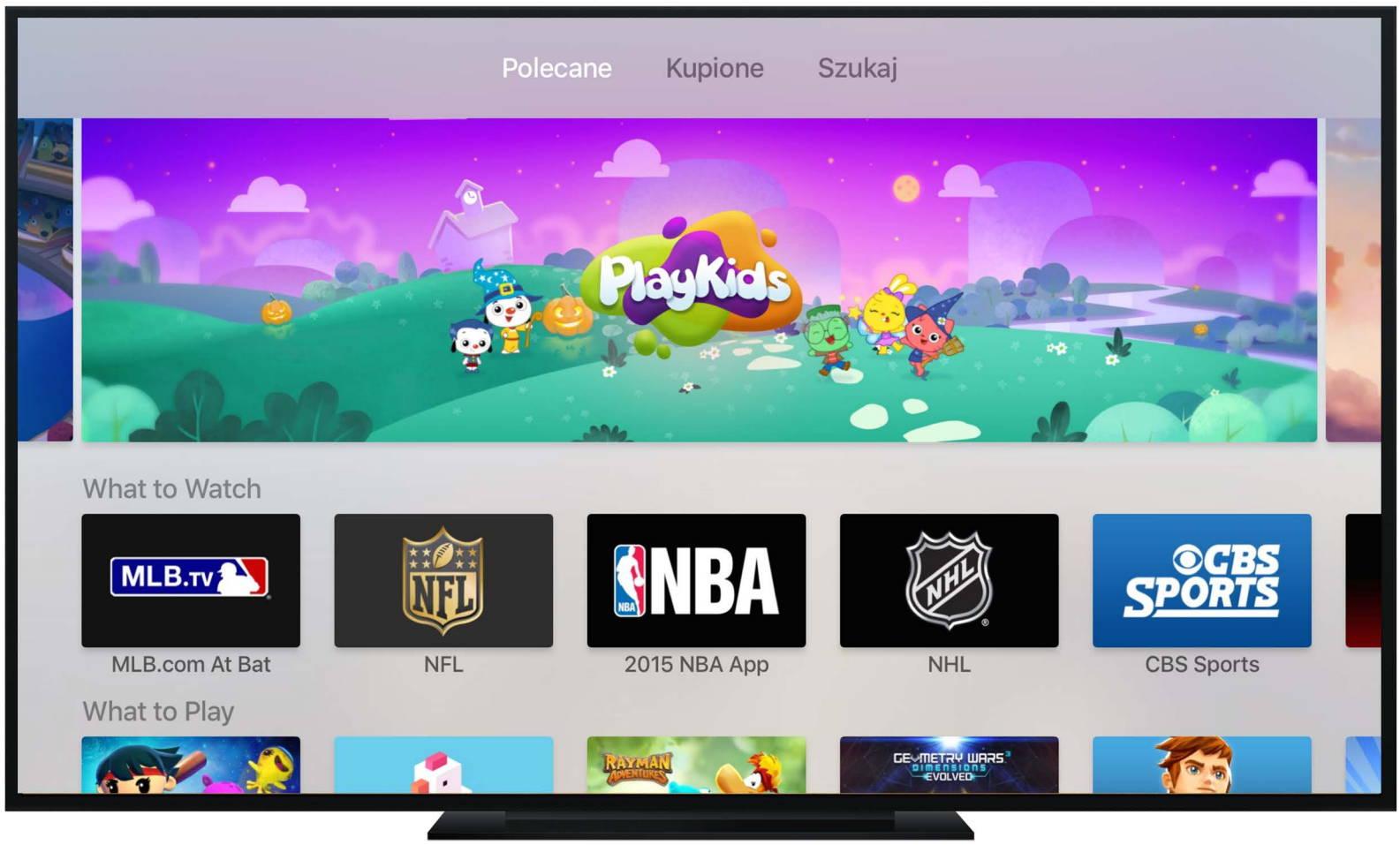
Apple Music

Access to Apple Music from the 4th generation Apple TV changes the little black box into a small multimedia stereo set. In some cases, music seems to sound better with the addition of moving pictures, especially the new live screen savers available on the Apple TV. Want to have fun? Play the “Blade Runner” soundtrack by Vangelis and turn on the screen saver with a nighttime panorama of San Francisco or New York. I might get bashed by some audio purists, but for the past few days I’ve been listening to music played by the new Apple TV via my TV set.

Apple Music looks far better on a TV screen that it does on an iPhone, iPad or even my MacBook Air. The panoramic “For you” or “What’s new” views are much clearer.

Apple Music on the new Apple TV gives access to almost all of the features of the service except the social network Connect. A lot of artists and bands I follow are very active on Connect, so I really miss that feature.





According to Apple, about 1,000 apps were available for the new Apple TV a few days after the release. That's a lot, but sadly a lot of them are trash. Fortunately, there are some good games and apps among them.

The App Store

and a simple game console

Having an App Store and the ability to install apps and games was the feature I was waiting for on the new Apple TV. The Apple TV is a small game console that perfectly suits my needs. Comparing the new Apple TV with a big game console is futile, and would cause a lot of unnecessary emotional arguments. But I'm one of a group of users who don't need a Playstation 4 or Xbox. I've been playing games with a gamepad on my iPad and iPhone, streaming them from the iOS devices via Apple TV to my TV screen. Now I don't need to stream them; I can play them directly on the Apple TV.

Some people argued with me, pointing at games like "The Witcher" as an example of why the Apple TV wouldn't be a successful gaming console. Well, there are a lot of people who don't play such games and don't need expensive consoles. For me and my older son, the new Apple TV — with games like Oceanhorn, Transistor, and Xenowork — is enough.

According to Apple, about 1,000 apps were available for the new Apple TV a few days after the release. That's a lot, but sadly a lot of them are trash. Fortunately, there are some good games and apps among them. In addition to the three games mentioned above, there are Asphalt 8: Airborne, Bad-

land, Alto's Adventure, Crossy Road, Almost Impossible, and Disney Infinity 3.0 Star Wars. The latter title is actually a playable demo — there is only one mission available, that of the raid on the Death Star during the Battle of Yavin (Star Wars, Episode IV: The New Hope). There are more games to come; for example, Gameloft is working on Dungeon Hunter and Modern Combat 5.

Adding a game controller is easy, and the games that let you use such accessories are clearly marked. Playing games with a true game controller is much more fun and natural than using the Siri Remote. In many cases, the latter is much less handy despite its built-in gyroscope and accelerometer.

Games for the Apple TV are available both in separate and universal versions. The latter games are those that were previously purchased on iPhone or iPad that are available to download for free on the Apple TV. The universal apps work the opposite way, too — I bought Transistor on the Apple TV, and it's now available to download on the purchased apps list on my iPhone and iPad.

I've noticed that games written for the Apple TV have better graphics compared to iOS games streamed via Apple TV and AirPlay to a TV. Video that's streamed over AirPlay is probably compressed somewhat, resulting in the loss of resolution, clarity and smooth animation.

Apple has limited app and game installations on the Apple TV to 200MB. That doesn't mean the real size of the game one is going to play. Rather, this is a base size, and users can download more levels, extra graphics, etc... In the case of games with sophisticated graphics, downloading them can take a few minutes depending on the speed of the network.

Users can look at the installed apps and games, and see the amount of internal storage they take up. The user can also quickly uninstall them if necessary to release more space.

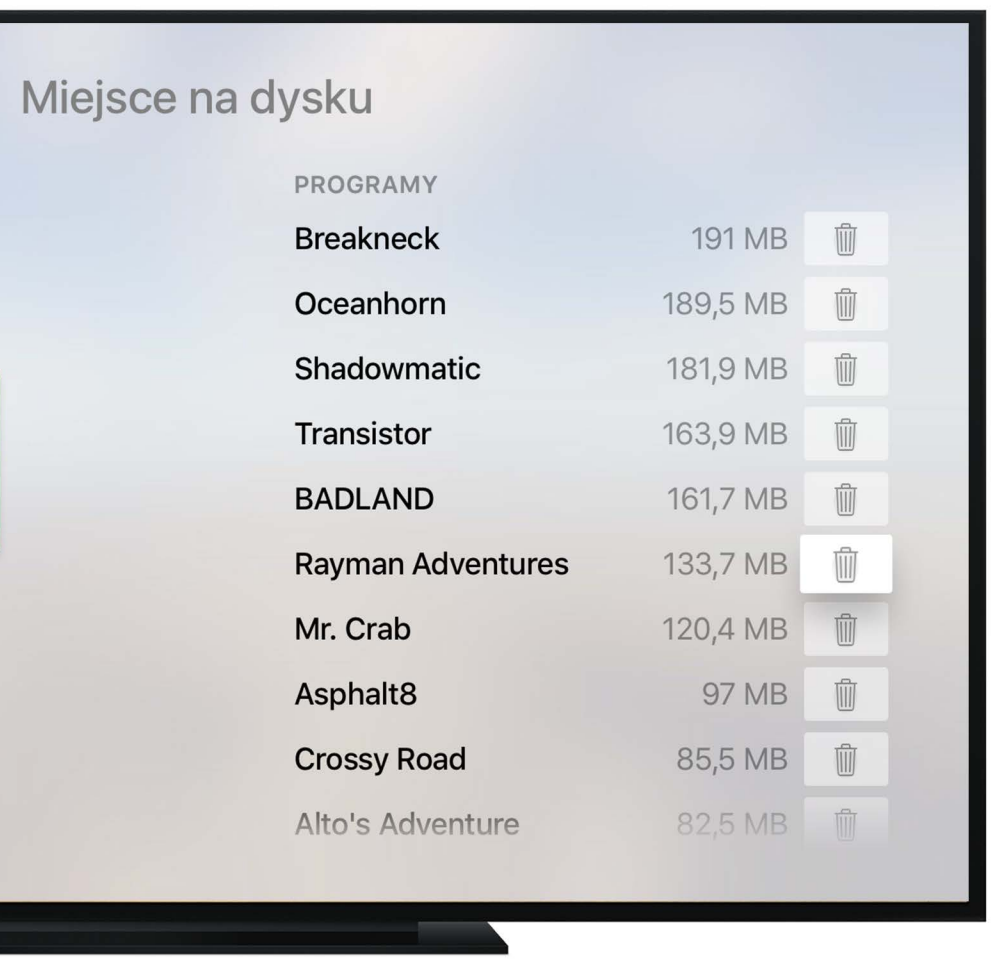
So what are some apps I'd recommend installing? I've already mentioned the National Film Board of Canada app, but there are a few others like PCalc (a calculator on a big TV screen? Why not!) and Speedtest, a popular app for checking the speed of one's Internet connection.

The Apple TV App Store still needs some polish. In the US App Store it's possible to find the Top 10 rankings, but this isn't so in the Polish store. Searching for new apps and games is a pain as well. What you do is type one letter at a time in a search field, then look at the results. A web preview of each app and game page would be handy, as well as links to them

The new Apple TV works great with game controllers. I've already mentioned the one I use, the Steelseries Nimbus. Adding a game controller is easy, and the games that let you use such accessories are clearly marked. Playing games with a true game controller is much more fun and natural than using the Siri Remote. In many cases, the latter is much less handy despite its built-in gyroscope and ac-

celerometer. Of course, it's possible to play every game with the Siri Remote, for all games must provide full control with it to make it into the Apple TV App Store.

... the latest incarnation of Apple TV has the potential to seriously rock the market for such devices. Just remember how many iPhones Apple sells — when looking for set-top boxes, iPhone users might prefer the Apple TV to other devices simply because it's in the same ecosystem full of apps and games they're familiar with.



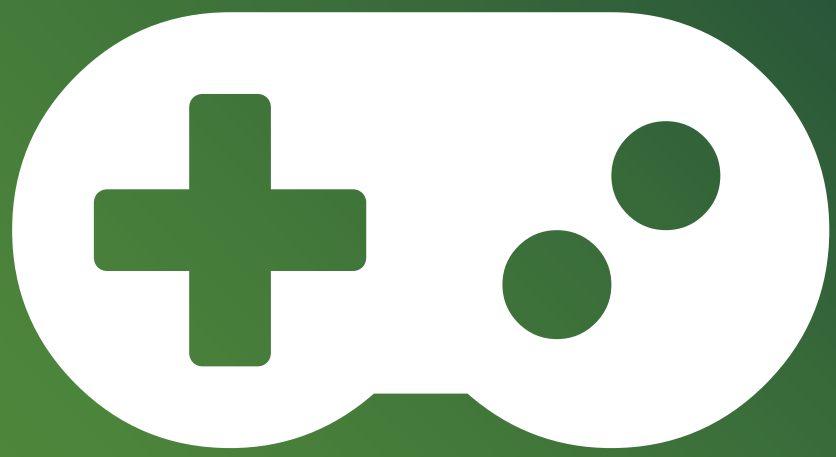
Revolution or evolution?

It's hard to call the new Apple TV a revolution when the first generation of the device was introduced over eight years ago in January, 2007. The set-top box that until last week was providing mostly very basic video on demand functionality finally got a serious upgrade with features I had long been waiting for — apps, games and a music service. Finally, Apple TV became the thing it should have been a long time ago, a small computer based on a modified version of iOS designed for family amusement.

Without a doubt, the 4th generation Apple TV is a fascinating product with a lot of potential that can't be compared feature-wise with the previous model. During September's Apple event, Tim Cook noted that the future of TV is in apps. That's very true in the case of the Apple TV. However, it should be remembered that similar functions are offered by competitive (and often less expensive) devices like Amazon Fire and Roku.

I'm of the opinion that the latest incarnation of Apple TV has the potential to seriously rock the market for such devices. Just remember how many iPhones Apple sells — when looking for set-top boxes, iPhone users might prefer the Apple TV to other devices simply because it's in the same ecosystem full of apps and games they're familiar with.

Photos: Apple / Polish Apple TV screenshots



You should buy a gamepad for your Apple TV if you are a regular player

Michał Masłowski

There are games that are suited perfectly to a touchscreen. I cannot imagine playing games like Cut the Rope in any other way than swiping my fingers on the touchscreen of an iPhone or iPad. There are even games that probably wouldn't have been created if there had been no smartphones and tablets with touch screens.

However, there is an entire category of games that can hardly be played on touchscreens. Instead, you want to sit comfortably in a armchair in front of your TV set and play them on a console with a gamepad. In this category I would put mostly car racing games as well as first-person shooters, but not just those games.

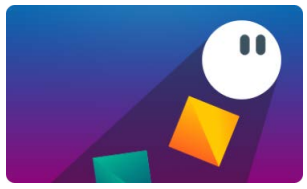
I bought a new fourth-generation Apple TV and I tried to play Rayman Adventures with the Siri Remote. How was it, you ask? It was completely unintuitive, uncomfortable and irritating! After a few minutes of playing I just grabbed the game pad that I luckily had just bought. And what happened? With the gamepad, the gaming experience with Rayman Adventures is excellent. I played acouple of games including Asphalt 8, but every time I tried to use the Siri Remote as a game controller I got irritated. Whose idea was it to use that remote as a game controller?

If you are going to buy the new Apple TV and play games on it, then I'll give you one piece of advice — you should purchase a proper game controller to use with it.

The best games for your new Apple TV

Krystian Kozerawski

The Apple TV is no longer just a simple set-top box offering only video on demand. Now it's a home amusement center with additional features like Apple Music, games and apps. It's been over a week since the release of the fourth-generation Apple TV, with about a thousand games and apps in the App Store. Here are a few I think are worthy of installation on your Apple TV



Almost Impossible!

Simple platform games had their golden age in the 1980s, a time of 8-bit computers and arcade video games. The high level of difficulty and intriguing puzzles, coupled with the need to improve ones skills continuously to make it to the next level or stage of the game, compensated for the simple and minimalistic graphics. In those days, even very simple graphics made of blocky pixels were good enough to attract gamers and were sometimes they were the main selling points of a game.

After three decades it seems that such games are still very popular. One of the latest games to prove that position is Almost Impossible! This is a fine example of a mixture of a platform and side-scroller game with difficult — and thus involving — levels, and 8-bit-like graphics plus a nice chip tune music soundtrack.

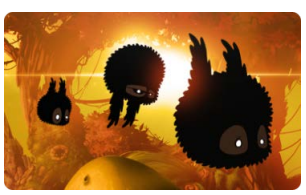
The game is simple enough — you control a little ball that moves in jumps. Although it can move either left or right, it usually moves to the right. Moving right, one has an opportunity to pass through one of fifty levels. The border between the levels is marked by a stream of particles flowing up the screen. Each level consists of platforms made of small square bricks, some of which are neutral and stand still. Others move up or down after being touched, and they can be either good or bad. And any bricks that are in a red color (usually) are best to avoid. There are also spikes to kill your ball and deadly red balls — touching any of those means an instant end to the game. Fortunately, the number of lives for the ball seems to be unlimited, and you start from the beginning of the last level reached.

Asphalt 8: Airborne

This is definitely not a new game. As with most of the good games available for Apple TV (with the exception of Almost Impossible!), Asphalt 8: Airborne was released a long time ago. I played it on my iPhone and iPad for the first time over two years ago. This isn't a game for fans of realistic car racing simulations, but at present it's about the only sensible racing game for Apple TV.

In Asphalt 8: Airborne, one races in a few scenic locations like London, French Guiana, Iceland, Tokyo, China, and the Nevada desert (including a structure that resembles Hoover Dam). The driving model is extremely simple. You don't need to press the pedal to the metal, as your car is floored all the time. You just need to steer left or right, turn on nitro, or use the handbrake for drift. This game is all about drifting and making impressive jumps over the chasms and viaducts, doing aileron rolls like an airplane.

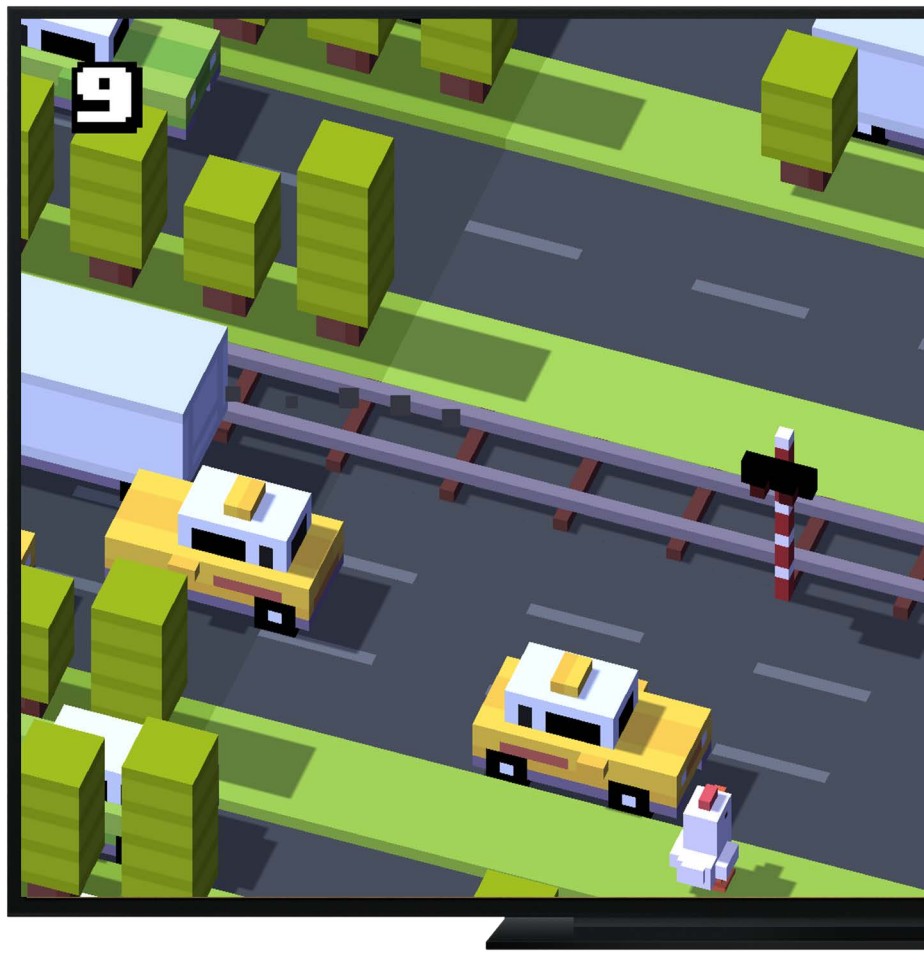
Asphalt 8: Airborne has excellent graphics that show off the potential of the new Apple TV.

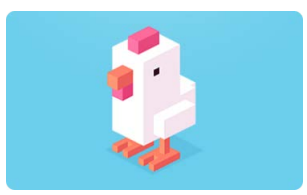


Badland

This is one of the most beautiful casual games for iOS and it's now available for Apple TV. The gamer steers a small hairy flying creature with tiny wings through a colorful land full of deadly traps and plants, machines like big knives, circular saws and fans, and along narrow paths. The latter are deadly, especially when your creature eats fruits that make it bigger. Of course, there are also fruit that your creature can eat to make it smaller and able to avoid all of the obstacles.

As with Asphalt 8, Badlands is a relatively old game, but due to its graphics and fun play, I would call it evergreen.





Crossy Road

Speaking of evergreen games, it's hard not to mention Frogger. In that very old arcade game, one had to lead the frog through a busy road or river. A new take on this old idea is the focus of Crossy Road. This time there are more creatures to lead across the mov-

ing obstacles, and there are not only roads and rivers, but also railways.
Crossy Road has a beautiful isometric 8-bit or 16-bit graphic look and offers dual player mode. The other gamer uses an iPhone running the Crossy Road app in a controller mode. Both players can cooperate or compete, even fight each other.

Disney Infinity 3.0 - Star Wars

At the beginning this game was just a short playable demo offering only one mission - attacking as a Luke Skywalker in his X-Wing fighter the Death Star with the other pilots of Rogue Squadron during the Battle of Yavin, a giant planet with a moon on which the rebels built their base. However a few days ago it was updated into a kind a front store with at least two console-quality games - both placed in Star Wars universe - a galaxy far, far away: “Twilight of the Republic” and “Rise Against Empire”.

I have chosen “Rise Against Empire”, since I grew up watching the old saga. I must admit I am still at the beginning of my journey, sightseeing Mos Eisley at Tatooine.

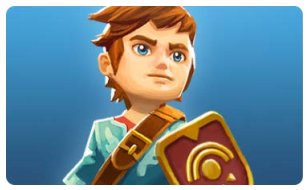
Does Not Commute TV

This is one of the most involving casual games I have every played, combining both arcade and strategy games in city traffic. The player has to lead each car, bus, bicycle and sometimes even a boat from a starting point to its final destination. Each drive is recorded, and with a new vehicle to lead the tape is rewinded to the beginning. Driving the next car, the driver has to avoid the ones he or she led before. They’re all moving and behave exactly the same that they did when led by the player, and that includes all of the accidents that they’re part of.

Starting with the very first car is quite easy. Later, the game becomes harder and harder, especially when you need to pass a crossroad full of cars you drove before. To make the game even more challenging, there’s not all that much time to drive the vehicles to their destination in each state. When your car crashes, it’s sometimes better to rewind the tape a bit and just start the ride over again. It will only cost you one second.

Steering cars is easy, since they drive at a constant speed and you just need to turn left or right. There is no brake pedal.

Each stage encompasses the exact same part of the bigger town or city, and is viewed from above. There are streets, bridges, parks and buildings you'll navigate through and around, and time bonuses that can be found on the streets or between buildings. Those usually provide the player with an additional 10 or 20 seconds.



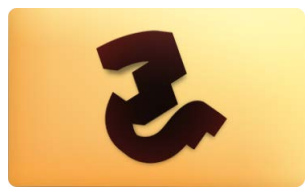
Oceanhorn

This is one of my favorite games for iOS. The player leads a young boy on a quest to solve big mysteries, including his father vanishing and the destruction of the land of Arcadia into small islands. He also has to face a great monster named Oceanhorn.

The little hero has to travel from one island to another to pick up sacred emblems of elements that will help him to defeat Oceanhorn. He talks to other people and creatures he meets, helping them with their own missions, saving others, and resolving minor riddles. All of them are jigsaw pieces, and put together, they create a picture and history of Arcadia, its fall from a land of plenty into an archipelago in the middle of the ocean. The hero meets other friendly creatures, but there are also hostile ones as well — trolls, goblins, insects, rats, bats and other strange monsters and machines created by the evil force that keeps the sacred emblems and uses them in a bad way.

The young boy can fight the hostile creatures by collecting new arms and experience points, as well as accumulating gold coins that can be spent on accessories like bombs and arrow. On each island there are locations cut off from the others that can be unblocked by finding a proper key or accessed another way — by water, for example.

Oceanhorn has beautiful isometric graphics and a wonderful soundscape. The game was criticized on iOS devices due to problems with steering the boy using the touchscreen on an iPhone or iPad, but with a gamepad there are no such issues.



Rayman Adventures

I would guess that there's no need to introduce any of our readers to the series of games about a strange fellow named Rayman. In this part of his adventures, Rayman's goal is to get back eggs that are stolen from the sacred forest. As in the previous Rayman games, this is a platform game. Rayman jumps from one platform, tree or wall to another, trying to fly thanks to a small propeller. On his way there are a lot of coins to gather, friends to free, and enemies to defeat. The game is loaded with stunning 2D graphics and has a nice soundtrack.

Shadowmatic

Shadowmatic is a kind of logic puzzle game. The player has to manipulate an object in order to make a shadow cast on the wall look like a specific shape — a cow, cupid, chess pawn, or some one practicing karate. Each time the shadow forms the proper shape, the next riddle starts. The player can manipulate each object that casts shadows. Sometimes there's more than one object, each of which can be turned in every direction separately, and they can all be turned at once. In all, there are about 70 different puzzles..

Photos: Apple / Apple TV Apps screenshots

New 27-inch iMac with 5K Retina display is Apple's best Mac yet

Dennis Sellers

The recent rev of Apple's iMac with 5K Retina display is the company's finest Mac ever. Use it and you may never be able to use any other computer again thanks to the gorgeous screen.

The latest incarnation of Apple's all-in-one is, hands-down, the world's best desktop computer. It's less expensive than the Mac Pro — and actually offers more bang for the buck. And the 27-incher is upgradeable, something the Mac mini isn't. The Retina iMac's performance is beefy enough for all but the most demanding "power users."

> For those of us who love movies, you can play a full HD movie in a portion of the display, and it's actually rendered in full 1080p. Blu-ray discs look marvelous on the iMac screen.

I have the base model that comes with a 3.3GHz quad-core Intel Core i5 (a zippy "Skylake" processor), AMD Radeon R9 M395 graphics and a 2 TB Fusion Drive. However, I doubled the standard amount of RAM (more on that in a moment). Performance is quiet and smooth with nary a hiccup.

Of course, the big feature is the screen. The Retina iMac comes with a 5,120-by-2,880-pixel display. That's double the vertical and horizontal lines (2,560 by 1,440) of the 27-inch Thunderbolt Display (which is way, way overdue for an upgrade).

With 14.7 million pixels, text appears super sharp, videos are unbelievably lifelike, and you can see incredible levels of detail in photos. For example, video editors can view a 4K (Ultra HD) video (3,840 by 2,160) at 100% while still having a boatload of pixels left over surrounding the video for media libraries, toolbars, and video timelines.

For those of us who love movies, you can play a full HD movie in a portion of the display, and it's actually rendered in full 1080p. Blu-ray discs look marvelous on the iMac screen; though, to play them, you'll need MCE's Super-BluDrive or MCE's Mac Complement. You should note that websites and video that don't scale to Retina standards look slightly blocky and jagged.

My biggest complaint is that the new iMac comes with a miserly 8GB of RAM, when 16GB should be standard. Oh well, it's easy to upgrade the memory which, according to Apple, can be boosted to 32GB — but which OWC lets you rev to 64GB.

As incredible at the 5K Retina display already was, Apple has improved it with the 2015 iMac. The tweaked display features a wider P3-based color gamut that provides a 25 percent larger color space and more available colors, making images even more vibrant and life like than before.

The new iMac uses a more advanced red-green phosphor LED for better balance and wider range. Each panel is also individually color calibrated at Apple's factories, and the color management built into OS X keeps things consistent across apps.

That said, and though reds and greens in particular look brighter, many average users won't notice the improved image quality unless they're closely comparing the displays of a 2014 iMac and a 2015 iMac. However, photo and video professionals will be thrilled at the enhancements — although to take advantage of the new screens, you need images or video saved in a format called DCI-P3. Mac OS X El Capitan's Photos app can now save to that format, but you'll have to start with high-quality images, such as those from a DSLR.

The iMac speakers are, as before, very good, but I'd like more (hey, I'm selfish). I'd love to see 10x stereo, front-facing speakers as shown in this fantastic **concept desktop** dreamed up by Apple fan and artist, Kurt Merki Jr.

My biggest complaint is that the new iMac comes with a miserly 8GB of RAM, when 16GB should be standard. Oh well, it's easy to upgrade the memory (which, according to Apple, can be boosted to 32GB — but which **OWC** lets you rev to 64GB).

Also, why no Thunderbolt 3 or USB Type-C ports? Apple is one of the forces promoting Thunderbolt and the company has heavily touted USB Type-C, which it introduced with the 12-inch MacBook.

Despite some minor complaints, this iMac is the Apple desktop is the closest Apple's ever come to providing me with my "perfect" Mac.

Photos: Apple

Are Apple's latest Mac accessories truly Magical?

Dennis Sellers

Apple's latest iMacs come with a revamped Magic Keyboard and the Magic Mouse 2. Both are solid updates and are environmentally friendly, though I'm not sure they're truly "magical."

Designed around a built-in rechargeable lithium-ion battery, the accessories eliminate the need for disposable or (standalone) rechargeable batteries and feature a noticeably more solid internal structure and quality feel. These are fine improvements, but I have a couple of qualms.

The new Magic Keyboard features a full-size keyboard in a design that takes up 13 percent less space than its predecessor. It has a new scissor mechanism and lower profile. If you think that sounds like the keyboard introduced with the 12-inch MacBook, you're right. New stainless steel dome switches located beneath each key deliver a responsive feel when typing with no "give" on the sides of the keys.

> There's another Magic accessory that doesn't ship with the new Macs: the new Magic Trackpad 2. (...) The price tag for the Magic Trackpad 2 is pretty stiff at $129. Under $100 would seem more reasonable to me. Or, better yet, ship it with all new Macs... (hey, I can dream, can't I?)

Since other keyboards wiggle a bit on the sides, this takes some getting used to. However, after about an hour, the new tactile experience had won me over, though not everyone may feel the same.

The new Magic Mouse 2 is lighter, sturdier and features an optimized foot design for a smoother glide. It features a 29 percent larger surface and brings Force Touch to the desktop for the first time. Force Touch enables a range of new ways to interact with your Mac, including the new Force click to quickly look up a word, preview a file or bring up a map from an address.

However, unlike the keyboard, the Magic Mouse 2 doesn't have the Lightning charging port on the back. It's on the bottom, which seems a design faux pas to me.

There's another Magic accessory that doesn't ship with the new Macs: the new Magic Trackpad 2. The price tag for the Magic Trackpad 2 is pretty stiff at $129. Under $100 would seem more reasonable to me. Or, better yet, ship it with all new Macs (hey, I can dream, can't I?)

I appreciate that the new Magic devices pair instantly with your Mac as soon as they're plugged in via the Lightning-to-USB charging cable. They work with your new desktop right out of the box. Apple says they'll last about a month or more on a full charge, though I've not been using them long enough to verify this.

Photo: Apple

The Wizard versus Muggles

Kinga Zielińska

There was a lot of pre-release speculation and rumors about the iPhone 6s camera. As usual, some of them turned out to be true, while others were just wishful thinking and perhaps ideas of the functionalities of the next Apple smartphone generation. As a photographer, I decided to see for myself what its camera was really like and for the first time I bought the newest iPhone — the iPhone 6s — on its launch day.

I always tell people that the camera is one of the most important elements of the iPhone for me. I've been using an iPhone 6 for a year now and was curious whether the newer camera could be a reason to upgrade to the latest iPhone generation. Or perhaps it's a better time for current iPhone 5s owners to change to the new device? To answer these questions, I took dozens of photos with the iPhone 6s, 6 and 5s cameras. The last two models — the 6 and 5s — are the iPhone generations with owners who are going to be the most interested in upgrading. All of the smartphones tested had iOS 9.0.1 installed. I divided the test into several parts, each of which shows the capabilities of each camera in different aspects:

- operation under different light conditions
- bokeh (background blur)
- noise
- sharpness
- color representation
- panorama
- flash
- selfie

Before we dive into the pictures and comparisons, let's try to summarize the changes introduced in the iOS camera app interface on the iPhone 6s running the latest version of iOS 9. Initially it appears that not much has changed, but the trained eye will immediately notice a new element in the middle of the upper bar, used to activate the Live Photo mode. When I first saw the Live Photo effect during the September Apple presentation, I thought the world of Wizards had finally collided with the universe of the Muggles. Live Photos literally animate when you press the 3D Touch display of the iPhone 6s, so our photos can capture not only the moment, but also the accompanying scene movement. We can use a Live Photo as a wallpaper on the lock screen and watch the image "move" as we press the display. These "magical" pictures can be captured with both front and rear cameras. Technically speaking, the Live Photo is a sequence of images consisting of the basic photo and a frame sequence with sound encompassing 1.5 seconds around the moment the photo is taken. Every photo taken in this format takes twice as much storage space as a regular static picture. There's also an option to convert a Live Photo into a regular image in Edit mode. For the time being, the Live Photos can only be created on the iPhone 6s and 6s Plus, but they can be viewed on all devices running iOS 9 or OS X El Capitan. According to what Apple announced during the September presentation, Instagram and Facebook will soon support previews of Live Photos.

Another novelty is the Retina Flash used by the iPhone 6s FaceTime camera, which allows us all to take even nicer selfies. This seemingly strange solution adopted from SLR camera flashes utilizes preliminary flash technology, in which the camera takes a test shot to determine current parameters of the ambient light and shooting conditions. As a result, the lamp doesn't always flash with the same light, but adjusts it exactly to current conditions both in terms of light intensity and color temperature. Retina Flash uses the display as the light source, flashing it with three times the intensity it's possible to set with the regular screen brightness control. The resulting selfie is devoid of unattractive shadows and in general makes a much better impression than self-portraits made with upper (ceiling) or existing (sunlight) lighting. A pleasant side effect of having a relatively large surface area (over 60 cm2 / 9.3 sq. inch for the model 6s and 82 cm2 / 12.7 sq. inch for 6s Plus) for the flash is skin smoothing and reduced reflections on nose, forehead and cheeks.

The iOS 9 Camera app still doesn't offer the possibility of shooting in the 16:9 widescreen format, **but third-party apps like Camera+ can be used instead**. As for Burst Mode shooting, already well known from pre-

vious iPhone generations, the shooting rate remains unchanged at 10 frames per second, although it is hard not to get the impression that the hardware capabilities of the iPhone 6s go far beyond that limit.

The ”Focus Pixels” technology introduced in the iPhone 6/6 Plus has never been fully explained by Apple, but we can assume with a high level of confidence that it is similar to the phase detection autofocus (AF) system used successfully for the last several years in DSLR cameras. Without going deep into technical details, it’s worth mentioning that the contrast detection autofocus system used previously (up to the iPhone 5s) is much slower and does not ensure proper operation in poor lighting conditions or when viewing uniform surfaces. The tests show it clearly - the 5s AF very often requires the camera to go through all available focus settings only to get back to the best possible position, so that the whole system is slow, capricious and gives the impression of being made of “rubber”. To make things even worse, another focus attempt is often made while you’re trying to take a photo, which in practice means the loss of many opportunities to take a good, sharp picture. With the iPhone 6 phase detection-based AF, improvements in operation are noticeable right from the first picture - focusing is predictable, fast and accurate. With the iPhone 6s, the speed and precision of focus is even more impressive. It seems to work instantly with absolute accuracy, even in adverse conditions.

In preparing this year’s iPhone generation, Apple also solved the problem of color areas “flooding” into adjacent parts of the image. This problem has afflicted many iPhone photographers for years. In practice, it means that elements of one color pass into another part of the image, blurring sharp boundaries between them. In order to address the phenomenon, the sensors of the latest models use so-called “deep trench isolation” technology, which puts individual pixels in optical isolators preventing the aforementioned blurring.

The iPhone 6s is also the first Apple product capable of recording video in 4K resolution (3840 x 2160 at 30 frames / sec). To imagine the level of detail of 4K video, think of this: in order to represent 4K TV set resolution with Full HD displays, we would need four of the latter put into two columns and two rows. In other words, for each 4K pixel we have to provide four Full HD pixels. This also means that a minute of 4K video will take up much more space than Full HD, 375 MB according to Apple’s tech specs. If you’re going to record more than 30 minutes of 4K video on your iPhone 6s, you should definitely think about getting more storage than the base 16GB.

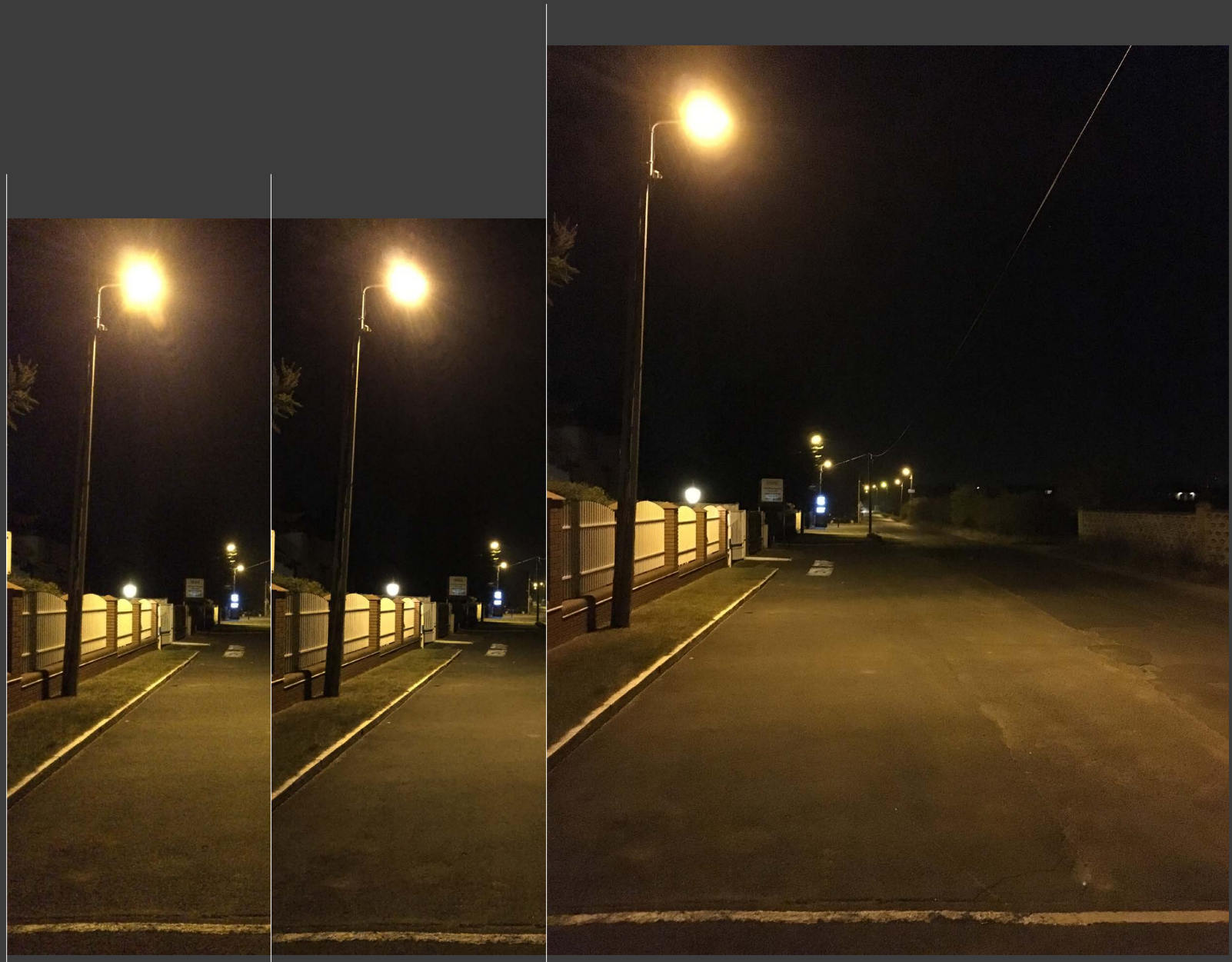
An example of 4K video recorded on the iPhone 6s

DOWNLOAD - 119 MB

Many of the following tests based on image sharpness or the ability of the camera to register as many details as possible naturally favor the iPhone 6s due to the fact it has the largest sensor pixel count to date. That’s why I tried to concentrate on other image parameters, under the assumption that the iPhone 6s will always have the best image sharpness.

Despite the manual camera mode available since iOS 8, most iPhone photos are still taken in automatic mode. That’s why I decided to test the new iPhone camera automatic mode under three lighting conditions - weak, average and strong light. So, without further ado, it’s now time for the photos and the first comparison.

Low light shooting



5s | 6 | 6s

As expected, photos taken with iPhone 6s contain the most details, although darker areas were captured best by the iPhone 6 camera. There is always some noise in the low-light shots, regardless of the quality of the sensor used, but the photo looks best when that noise is uniform, fine and devoid of color artifacts. That's the case with the photo taken with the iPhone 6s, which additionally gives the impression that the scaled-down image seems to be smoother and less affected with JPEG compression artifacts.

Average light shooting

5s | 6 | 6s

Composing a scene with one well-lit object and the rest of it in shadow revealed visible differences in the exposure algorithms of each tested smartphone. The iPhone 5s photo shows how little, when compared to 6 and 6s, information was recorded by the camera. On the other hand, the 5s shadow color is the most authentic, but the amount of noise in the shadow remains much higher than for the other two cameras. What's important is that none of the iPhone cameras have over- or underexposed the image, despite the tricky scene lighting.

Photos in bright light

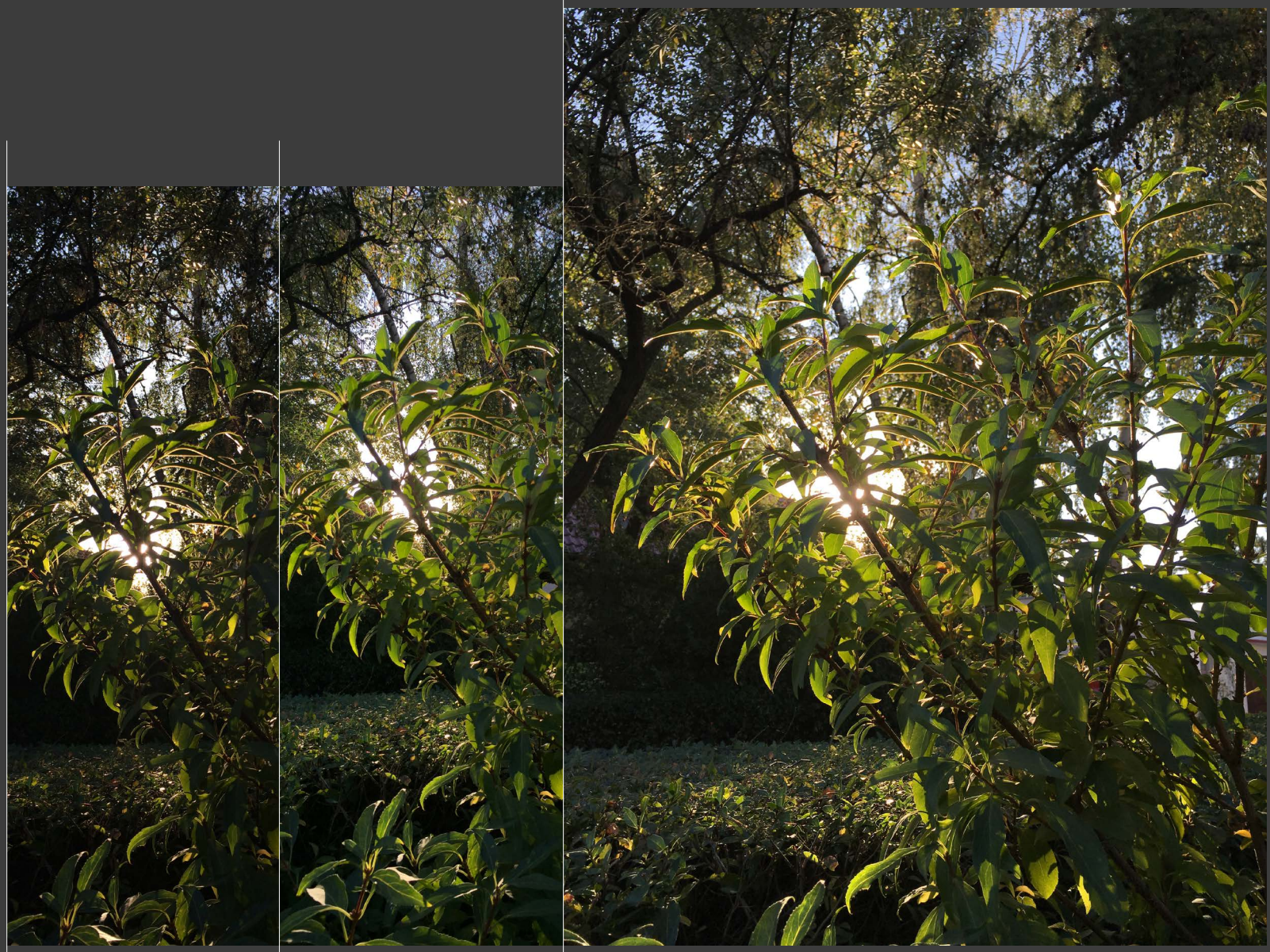
5s

6

6s

The 5s camera has warmed the scene a bit more than the other two models, but this is a well-known characteristic of “5” series devices. The colors of the shadowed areas were reproduced better by the the iPhone 5 and 6s this time, while the iPhone 6 washed blacks a bit. What’s also interesting here is that in the iPhone 6s shot there are visible objects reflecting in the floor - people, windows in the door. This might indicate some changes in the camera lens used in the latest iPhone generation (decreasing the polarization index, for example).

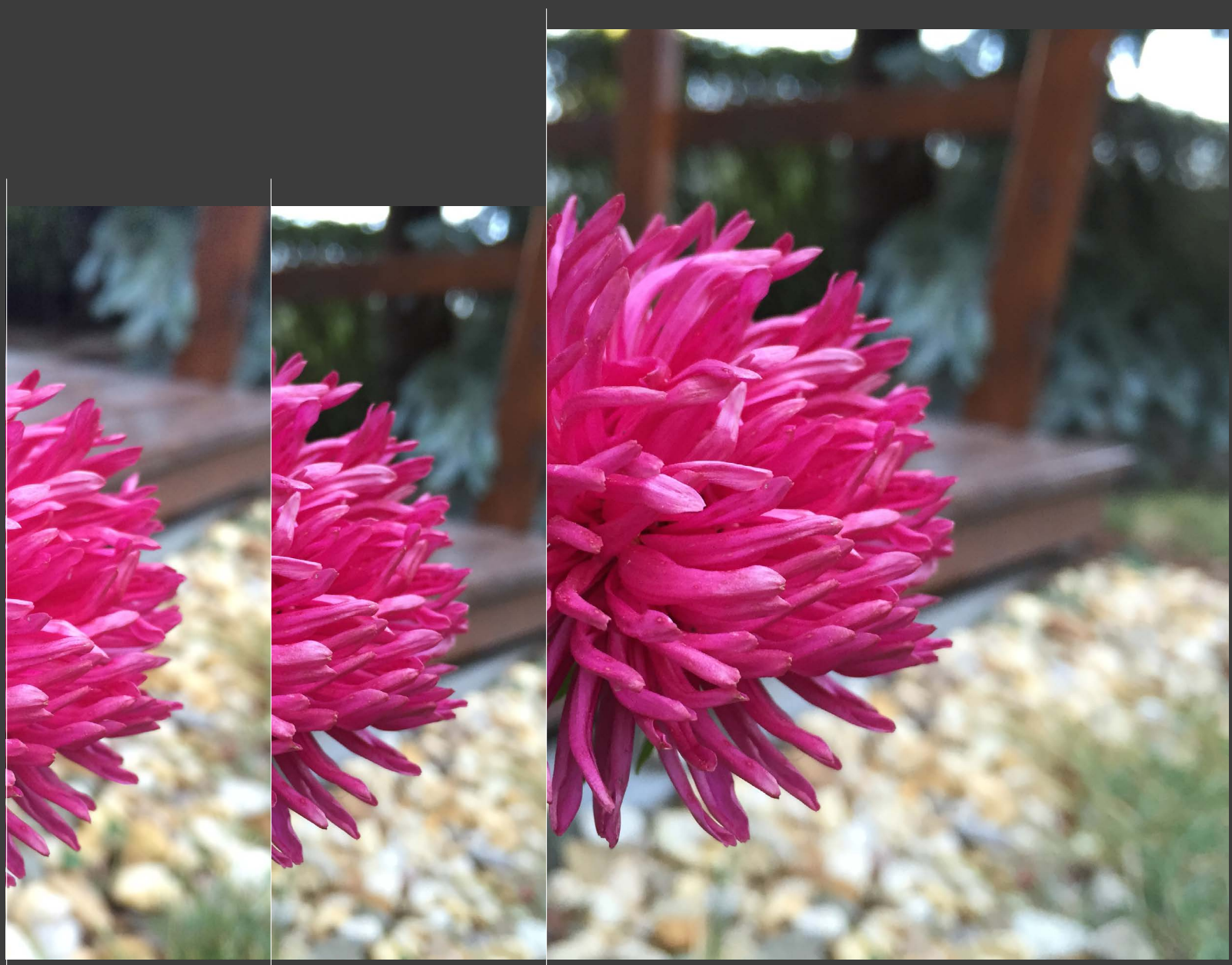
Shooting against the sun



5s | 6 | 6s

This kind of shot is always demanding for both the camera and the software managing it. This time, all three iPhones did very well, although we can identify aspects that differentiate them. The iPhone 6s is the only camera that has not introduced any visible chromatic aberrations (the delicate purple tint near the very light and dark border areas) which can be seen on the other two photos, especially the one shot with iPhone 6. It was also able to reproduce all the details of chiaroscuro, providing clear information about the details in the darker parts of the picture. The 5s generation, in turn, faithfully recreated the subtle shades accompanying the setting sun. The two other cameras provided a somewhat bolder approach in terms of lighting up the shadows and illuminating shaded bush leaves. Maybe it looks more attractive, but it's not quite how it looked to the eye when the picture was being taken. The iPhone 6 faithfully showed the colors of illuminated leaves, presenting the appropriate variety of greens.

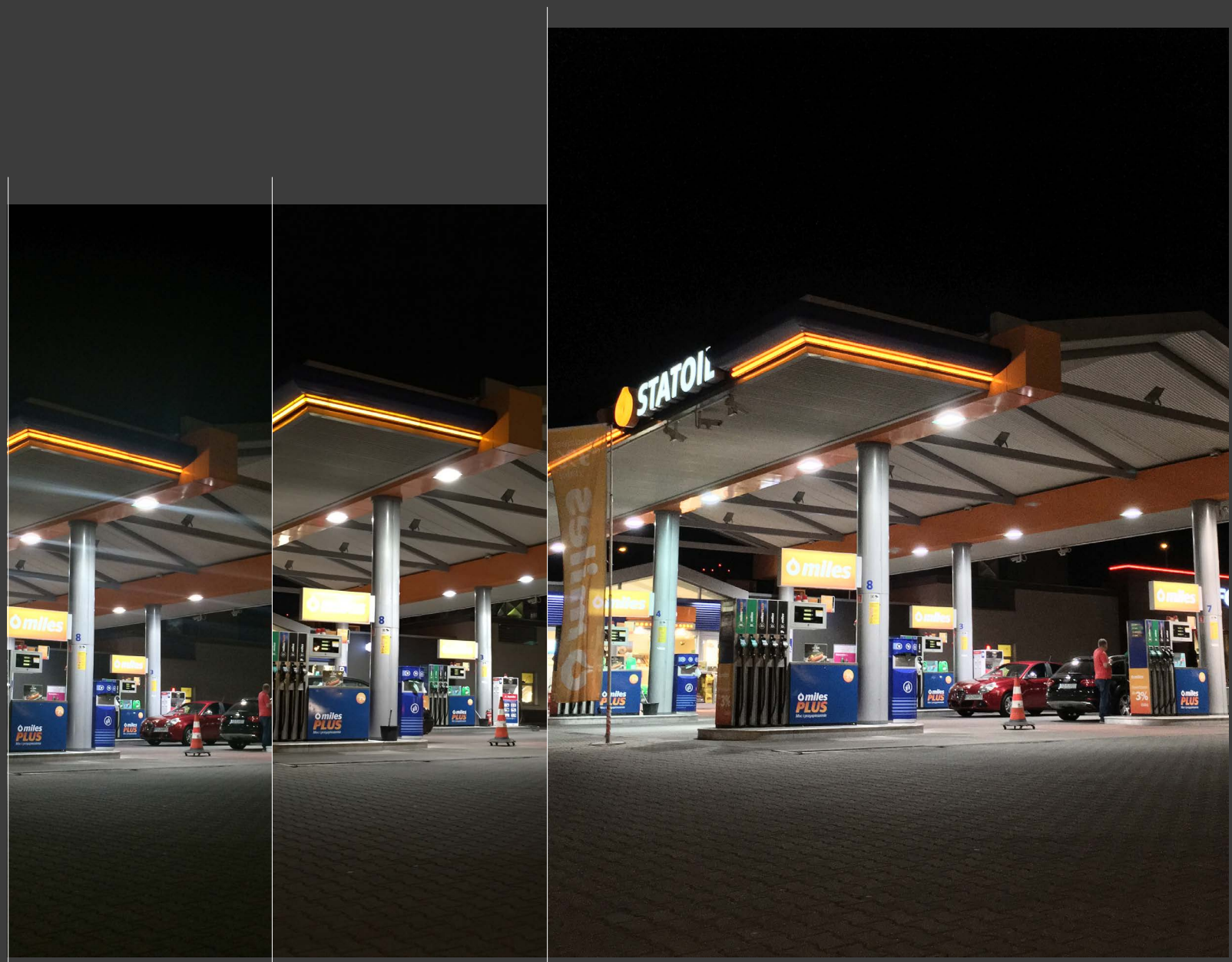
Bokeh



5s | 6 | 6s

This artifact of so-called depth of field, which blurs the part of the scene outside of our interest, is influenced by many factors but the most important are the aperture size of the lens used and the distance from the subject. All three tested devices have the same fixed aperture - f/2.2. There are probably some minimal differences in their lenses. Test shots were made on the same subject at the same distance, so the background in them should be equally blurred, too. The tests show that what is common to all of the tested devices is only their ability to blur the background — the quality of the bokeh is an individual camera feature. The 5s camera as usual adds noise to the background and washes out colors so that they appear as they would through a dusty window pane. The iPhone 6 can do better than this, but it has a slight tendency to mix the neighboring spots, giving them a shapeless form. The iPhone 6s camera did the best with this part of the test, reproducing nearly SLR-grade bokeh.

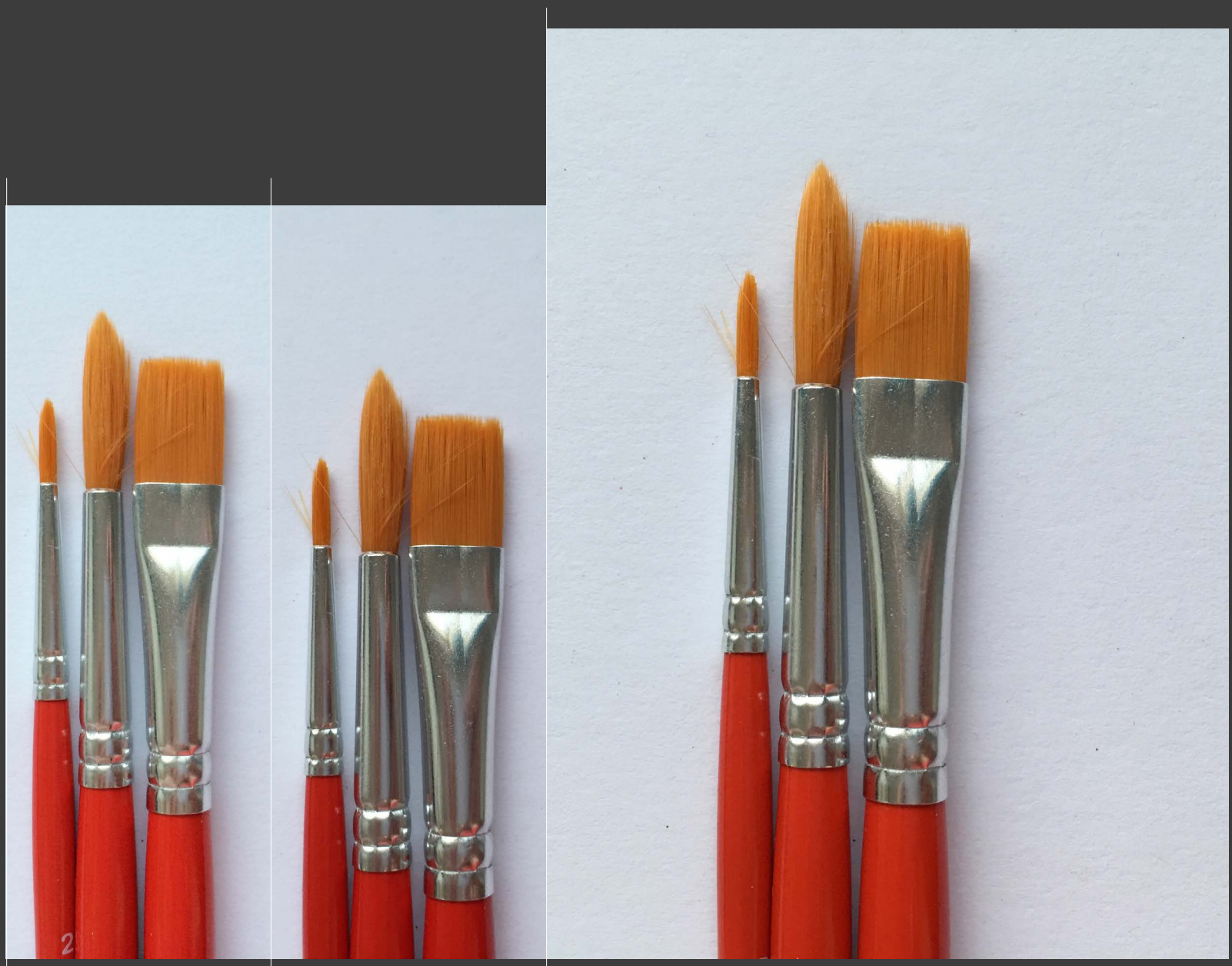
High-ISO noise



5s | 6 | 6s

In this category, the iPhone 5s camera noise in low lighting conditions once again takes its toll. This phenomenon has unfortunately also affected the color reproduction, level of details, and the number of unwanted artifacts (as the JPG compression algorithm is trying to “save” the noise it introduces pseudo-random artifacts in the output file). The amount of detail in underexposed areas proved to be best with the iPhone 6s camera, reached somewhat at the expense of slight grain, which fortunately is of much higher “quality” on this model and does not seriously degrade the picture. The iPhone 6 appeared to be the best at reproducing the blacks, but had some problems with contrast parts (illuminated signs are overexposed and unreadable).

Sharpness



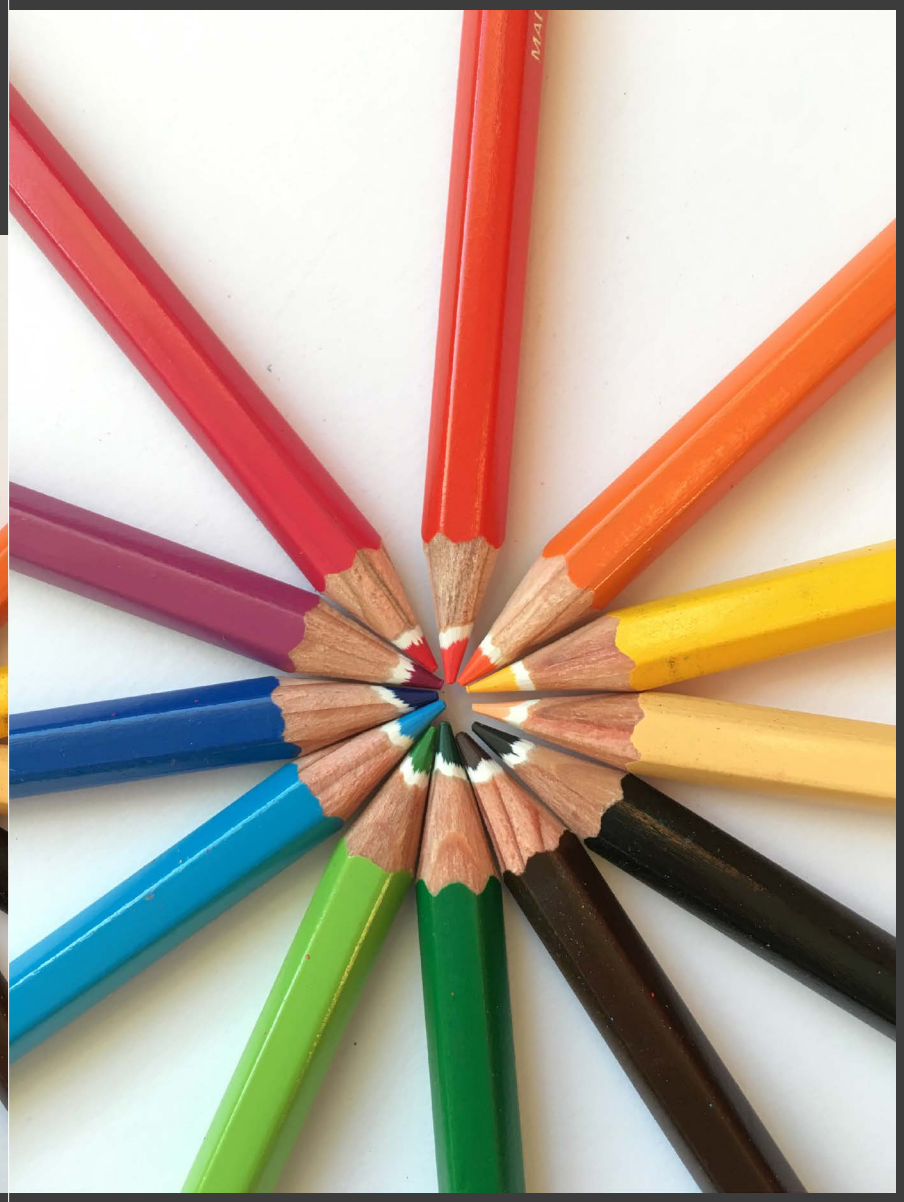
5s | 6 | 6s

Image sharpness is the camera's ability to maintain fine details of objects such as hair or fur, which can be lost through excessive noise reduction or sharpening. The iPhone 5s and 6 cameras, although using sensors with the same pixel resolution, do not show the same level of detail. The iPhone 5s image makes it difficult to differentiate the brush hair, as if shadow and detail data have been lost in the process of saving the picture file. The iPhone 6 coped with this task almost as well as the iPhone 6s did, perhaps due to its smaller sensor, but larger pixels (8MP / 1.5µm in the iPhone 6 and 12MP / 1.22µm in the iPhone 6s).

Color reproduction

5s

6



6s

If any iPhone 5s owners had concerns about the validity of upgrading their phone to an iPhone 6 or 6s up to this point, this image should dispel any doubts. The differences between the 5s and the other two models are just plain devastating to the the 5s model, from the color quality to focus, the wood texture fidelity, and the contrast of the entire scene. Interestingly, the last two generations of iPhone cameras have achieved quite similar results (of course, if we ignore the differences between their sensors), making the iPhone 6 still an attractive alternative to the iPhone 6s in terms of its photographic capabilities.

Panorama

5s

6

6s

With each step along the development of the iPhone camera, Apple has tried to solve different problems related to automatic creation of panoramic images. The most important factors here are to ensure consistent brightness, contrast and saturation for the output file and to make the stitching areas as invisible as possible. While the first challenge was overcome by Apple a long time ago, the image stitching is still an issue as shown in the photos taken for this part of the test. The “joints” seen on the pictures show different approaches to trying to resolve this problem, with stitches and artifacts resulting from the joining process visible for all three generations of Apple smartphone. Of course, a more serious approach to taking a panoramic picture would require using a tripod with a rotating head which probably would improve the output result of the joining algorithm and the overall final effect. Let’s be clear about it, though: not many people with iPhones in their pockets carry such equipment, and instead use themselves as a “tripod” most of the time. That’s why I decided to handhold the iPhones to perform this part of the test.

Due to the larger pixel count, the iPhone 6s saves much larger panoramic image files than its predecessors (63 MP for the iPhone 6s vs. 43 MP for iPhone 6 and 28 MP for iPhone 5s), which means not every application can handle an image of this size.

The flash lamp

5s | 6 | 6s

The “True Tone” flash introduced in the iPhone 5s consists of two LEDs: cool white and amber. During the so-called pre-flash, the color temperature of the scene is determined and set by choosing the color proportions of both flash LEDs. Apple says the flash can fire with over 1,000 different color temperatures, which should be sufficient for the vast majority of everyday situations and types of lighting. This does not mean that the two elements give twice as much light, but only that the temperature of the flash is chosen so that it lights up the scene as naturally as possible.

During testing, I found that the iPhone 6 and 6s flashes illuminate the scene a little better than the original 5s version, which may mean that some changes and improvements have been made along the way. It is not known whether that’s the result of greater power and improvements made within the flash or due to increased sensor sensitivity in the newer iPhone models. It also appears that the flash algorithm for choosing the color temperature has been revised in the latest generation of iPhone, because the picture made with this model appears to have the best representation of the actual colors of the scene (both the iPhone 5s and 6 made the image slightly warmer than in reality). Blacks are represented the worst in the photo taken with the iPhone 6 (appearing more like dark grays), while the iPhone 5s and 6s did much better here, with the former surprisingly performing the best.

Selfie

5s

6

6s

As mentioned earlier, Apple introduced a front flash solution called Retina Flash in the iPhone 6s. The explicit target of the feature are people taking a lot of self-portraits, commonly called “selfies”. Looking at my test selfies taken with previous models at 100-percent scale I was about to shout “God, how ugly I am!”. But then what I saw in the selfie taken with 6s made me almost burst into tears - thanks to the front sensor being bumped up from 1.2MP to 5MP, I could suddenly see all the imperfections of my skin and face. I warn you: do not buy the iPhone 6s if you do not want to find out the same about yourself ;). Fortunately, the Retina Flash brightened up my face, magically smoothing the skin and causing the next 6s selfie to be cool again :).

What is constantly noticeable after the release of each new iPhone generation is the fact that Apple greatly cares for continuous camera development in its smartphone. The fact that the camera is always Apple's "icing on the cake" is always widely discussed and commented upon. Some new features are applauded, while some are booed. Nevertheless, looking at the results of the above tests - let's be honest - if we leave out the larger sensors, Live Photos, Retina Flash and the possibility of recording 4K material, the everyday photography differences between the iPhone 6 and 6s are rather... symbolic. The real revolution awaits the owners of the iPhone 5s and older models, where they'll benefit from improvements ranging from faster and more accurate autofocus to minimal noise and beautifully rendered vivid colors. If you use the iPhone 6 and you don't feel a sudden desire to immerse in the magic world of Live Photos wizardry, you can safely wait with the rest of the Muggles for the next Apple smartphone generation — just as I'll do. Maybe the next iPhone will be even more magical?

The archive of all photos taken during this test **can be found here**. They come as unedited and raw original files as saved by the tested cameras.

DOWNLOAD - 109 MB

Photos: Kinga Zielińska i Marcin Kosmowski

iPad mini 4

Jacek Zięba

Last year's release of the iPad mini 3 let down many users and fans of this smaller Apple tablet. Except for a screen with a wider color gamut and the addition of Touch ID, it offered no other improvements. The future of smaller iPads seemed rather dim, and it appeared that bigger iPhones met the needs of users who wanted a device with a bigger screen. Was it an end to the iPad mini product line? Not at all! The latest model — the iPad mini 4 — is even lighter, thinner and faster, and I know there is no smartphone that could replace it.

The screen did get new antiglare and oleophobic layers. The antiglare feature proves its worth while working with hard ambient light (especially daylight), reducing reflections and turning them into a light purple glow that is not a problem. Unfortunately, the oleophobic layer only slightly reduces streaks and fingerprints on the display.

Those change in form factor are noticeable instantly when you grab the device with your hand. Maybe making it thinner (from 7.5 to 6.1 mm) doesn't matter that much, but the reduced weight (about 30 grams) does! The iPad mini 4 is incredibly light. It is hard to believe that the Apple engineers were able to create a product with such a great size and weight ratio. Talking about numbers, it is worth mentioning that the iPad mini 4 is about 3.2 mm longer than its predecessor — that's long enough that it can cause some problems when trying to use cases for the iPad mini 3. One thing hasn't changed - there is still a Home button with first-generation Touch ID.

The resolution of the Retina display also hasn't changed, still at 2048 x 1536 pixels with 326 pixel per inch density. The screen did get new antiglare and oleophobic layers. The antiglare feature proves its worth while working with hard ambient light (especially daylight), reducing reflections and turning them into a light purple glow that is not a problem. Unfortunately, the oleophobic layer only slightly reduces streaks and fingerprints on the display. The screen itself is bright enough, with crisper colors compared to the previous generation. However, those who have had a chance to work with the newest OLED screens may not be satisfied with the reproduction of black color. The only thing I can really complain about is the gap between the screen and front glass, which is bigger than in the iPad Air 2.

The heart of the iPad mini 4 is a modified dual core 64-bit 1.5 GHz A8. However, due to the 2GB of RAM and improved GPU, it is closer to the A8X than to the processors used in the iPhone 6 and iPhone 6 Plus. The new system on a chip was manufactured by TSMC

using a 20 nanometer process and it is about 30% faster with the GPU being 60% faster than its predecessor. The most noticeable improvement is 2GB of RAM. You can have more apps or Safari websites open without needing to reload them every time when you return to them.

The smaller form factor forced Apple to use a battery with less capacity compared to the previous model. It is a 19.1-watt-hour lithium-polymer battery, while the iPad mini 3 had a 23.4-watt-hour battery. Despite that, the number of hours the device will work on a single charge hasn't changed — it can still last for 9 hours surfing the web on a cellular network...

While taking photos with the iPad isn't probably the best idea, the relatively small size of the new iPad mini makes using it as a camera quite comfortable and easy. There is an 8 megapixel BSI matrix iSight camera with an f/2.4 five element lens on the back. The camera can record 1080p video at 30 frames per second and slow motion video at 120 frames per second. As you'd expect, the front-facing FaceTime camera is less impressive with its 1.2 megapixel matrix. It can record 720p videos.

The iPad mini 4 is available in three colors - silver, gold and space gray. As usual, there are also both Wi-Fi and Wi-Fi + Cellular versions. The smaller form factor forced Apple to use a battery with less capacity compared to the previous model. It is a 19.1-watt-hour lithium-polymer battery, while the iPad mini 3 had a 23.4-watt-hour battery. Despite that, the number of hours the device will work on a single charge hasn't changed — it can still last for 9 hours surfing the web on a cellular network thanks to the much more power efficient iOS 9 and A8 processor.

The iPad mini 4 is an excellent device that gave me back my faith in smaller tablets. Its convenience, size and weight play great with the screen size that is perfect for daily use. Thanks to the new design, the iPhone won't totally replace my iPad, even if I do use it more often.

Photos: Apple / Jacek Zięba

Satechi Bluetooth Universal Gamepad:

A classic gamepad for your iOS device

Steve Sande

Do you do a lot of gaming, especially of the retro arcade type? Then you are probably going to love the new Satechi Bluetooth Universal Gamepad (US$39.99, $34.99 through Amazon.com), a full-featured 14-button gamepad that has all of the controls that you're used to on a "real" game controller.

Design

The Satechi Bluetooth Universal Gamepad looks and reacts like your typical game controller. There are a pair of self-centering joysticks, a D-pad, and the standard ABXY buttons for thumb control, as well as two pairs of “trigger buttons” (marked R1, R2, L1 and L2) to be used with the index fingers.

There are also buttons for Select, Mode, Start and Mouse, as well as a Link button. When the Gamepad is turned on through a slide Off/On switch on the bottom of the unit, the Link button is used to link to your iOS device while the Mode button switches to iCade Mode for iOS. Four LEDs indicate charging mode, iOS iCade mode, Android Mode and joystick mode for a computer.

The unit uses a rechargeable battery that is connected to a power source with widely-available USB to micro-USB cables.

Finally, if you’re using any device from the size of an iPhone 6s Plus on down, there is a spring-loaded cradle that holds your device in place. You’ll probably need to remove any case that you have on the iPhone since even a really thin protective case will make the smartphone too thick to fit into the channel on the top of the gamepad.

Function

The first thing any gamer will want to do if using the Satechi Bluetooth Universal Gamepad is to see if their favorite game app supports the iOS iCade standard. Sadly, there aren’t a huge number of games — just search the App Store for the term iCade and you’ll see what I mean — and most of them are retro 8-bit types like **Alsteroids**, **The Invaders**, **RPG Quest**, and the rather fun **The Other Brothers**.

Nonetheless, there are hours of fun to be had with those games, and who knows? You might find out that your favorite iOS game allows for connection to Bluetooth controllers. That exercise is left up to the reader.

I downloaded a handful of apps to try, paired the Universal Gamepad to work with my iPhone, and then started playing. The Satechi controller is responsive, very comfortable for longtime use, and works up to 28 feet away. I’m hoping that tvOS app developers provide support for this device and that it will work with the new Apple TV, as it would be perfect for that.

One thing I did find is that I could use the Gamepad as a mouse-type controller on my Mac. It paired instantly, and when I switched to the “Joystick Mode for Computer” on the Gamepad, I was able to use the right joystick to control my mouse pointer and then use the L2 and R2 buttons to left and right click respectively. If you have any Mac games that can be played with a mouse or trackpad, the Gamepad might work well for you. Satechi doesn’t advertise Mac compatibility, but it worked fine for me.

Conclusion

Who is the Satechi Bluetooth Universal Gamepad for? If you play iOS games that use the iCade controller standard, have an Android smartphone or small phablet that you use for gaming, or can use a mouse or trackpad to control your favorite Mac game, then the Gamepad is an inexpensive, comfortable, and fun to use wireless game controller.

Photos: Satechi

BrydgeMini Review

Steve Sande

One of the toughest assignments for an iPad keyboard manufacturer to face is trying to make a keyboard for the iPad mini. The tiny tablet usually forces designers to cram keys too close together, move seldom-used keys to unfamiliar locations, or even make the keyboard case larger than the mini in order to accommodate the keys. When Brydge asked if I'd like to review the new Brydge for iPad mini 1, 2 & 3 (US$129.99, affiliate link), I jumped at the chance since I was impressed with their BrydgeAir Keyboard for iPad Air 1 & 2. Let's take a look and see how the smaller sibling of that 5-star keyboard case fares.

Design

The basic design of the Brydge for iPad mini — AKA BrydgeMini —is quite similar to that of the BrydgeAir in that the keyboard acts as a cover for the screen of the device, held on with two small silicone-lined tabs that are attached to 180-degree hinges. That gives the tablet a remarkable range of motion when it is installed, from fully-closed to laying flat next to the iPad mini.

A lot of other keyboard cases and covers for the mini share a common problem — the opening around the Lightning port is small, meaning that the case blocks special cables like the Lightning to VGA Adapter. Not so with the BrydgeMini, which gives unfettered access to all of the switches and ports on the iPad mini.

On the front edge of the BrydgeMini are a sliding on/off switch and a pairing button. A single micro-USB port is used for charging, with a charge expected to last for up to three months of usage. It takes about an hour to fully charge the BrydgeMini.

The BrydgeMini lacks the speakers that are built into the BrydgeAir, but there's a reason for that; there's simply not enough room in the diminutive keyboard. Four large rubber feet ensure that the keyboard won't slide on surfaces, a small pair of rubber "bumpers" near the bottom row of keys keeps the keyboard from contacting the mini's screen.

A lot of other keyboard cases and covers for the mini share a common problem — the opening around the Lightning port is small, meaning that the case blocks special cables like the Lightning to VGA Adapter. Not so with the BrydgeMini, which gives unfettered access to all of the switches and ports on the iPad mini.

You might expect a keyboard this small to lack the backlighting that is built into the BrydgeAir, but that's not the case. With a press of a "lightbulb" key on the top row of the keyboard, the white backlighting turns on, and successive presses bring it through two higher levels of brightness. This is intelligent backlighting, too — if you don't touch a key

for a while, the backlighting turns off to conserve battery power. Tap a key, and it comes right back up.

To get all of the keys into a small space, they're a bit smaller than on the BrydgeAir or Apple's Magic Keyboard. The spacing is good on the keys so an off-center keypress won't result in a misspelling.

There's no need to push the mini into a case of any sort, and I know from experience with the BrydgeAir that should I need to separate the mini from the keyboard, I can do that easily as well.

There are six rows of keys, featuring all of the regular keys you'd expect plus some mini-specific keys for Home, Lock, backlight, brightness up/down, on-screen keyboard, Spotlight search, reverse/play/pause/fast-forward, and volume up/down. The 2 and 3 number keys are set up to type the Euro € and British Pound £ keys through a function key combo.

The keyboard matches the current colors of the iPad mini line; silver, space gray, and gold.

Function

Installation of the BrydgeMini is a snap. You basically flip the hinges up, line up the iPad mini with the keyboard, and then push the mini down into the silicone pads in the "jaws" that are on the hinges. There's no need to push the mini into a case of any sort, and I know from experience with the BrydgeAir that should I need to separate the mini from the keyboard, I can do that easily as well.

The "jaws" on the hinges are aligned perfectly with the sides of the mini screen so that none of your view is obstructed. Likewise, if the user needs to tap anything on the iPad mini's screen, there are no obstructions keeping him or her from doing so.

The backlighting on the keys is bright enough to allow work in total darkness. All of the other special iPad function keys work very well.

The test of any keyboard, whether for a full-sized iPad, iPad Pro, or iPad mini, is how it feels and natural it is to type quickly on it. I found it very easy to adjust to the small-

er size of the BrydgeMini, and the entire "Function" section of this review was typed at top speed on the mini.

> I've always considered the iPad mini to be the least productive unit of all of the iPad line simply due to the lack of decent keyboards for it. The BrydgeMini is hands-down the best keyboard for the iPad mini, turning the little tablet into a workhorse of productivity.

Several keys on the keyboard do double duty out of necessity. The Q key, for example, shares space with the grave accent and the tilde. To type a tilde, you press the function key, shift key and Q key. Typing a vertical bar or "pipe symbol" is done by typing function-shift-].

The good thing is that the most important keys -- the letters, numbers, and punctuation -- are all in the proper locations for speedy typing. While the Return and Shift keys are the size of a regular key instead of elongated, they're still exactly where you'd expect them to be, making use of those keys simple.

Hats off to the designers of the BrydgeMini, as they put a bright green LED below the caps lock key to indicate when the keyboard is in caps lock mode. I don't know how many times on other iPad and iPad mini keyboards I have accidentally tapped the caps lock key before typing in a website password and not known since there was no caps lock indicator. As you'd expect, the BrydgeMini has magnets built into the front end of the keyboard so that when the keyboard is closed, the mini shuts off. The inverse is true as well, with the screen turning on when the iPad is lifted into typing mode.

Like its big brother, the BrydgeMini has a solid feel thanks to its all aluminum construction. The ability to tilt the iPad to almost any angle between 0 and 180 degrees makes it possible to adjust it to whatever is the most comfortable for you.

Conclusion

To be honest with you, I've always considered the iPad mini to be the least productive unit of all of the iPad line simply due to the lack of decent keyboards for it. The BrydgeMini is hands-down the best keyboard for the iPad mini, turning the little tablet into a workhorse of productivity. Sure, there are a lot of cheaper Bluetooth keyboards for the iPad mini -- there seems to be a fire sale on Amazon right now of $19.99 mini keyboards -- but in the case of the BrydgeMini the old saying that "You get what you pay for" is definitely true.

At press time it's unknown if the keyboard will work with the upcoming iPad mini 4. It might take just a slightly thicker silicon pad, and since Brydge already includes two pads (black and white) with the BrydgeMini, including another one in the box wouldn't be an issue.

I have absolutely no complaints or qualms about this keyboard, and I look forward to using it with the iPad mini as a very portable writing workstation.

Photos: Brydge Global Pte Ltd

Staying productive at home
with your Mac

Dave Caolo

Personal productivity is not a new topic. In the more than 12 years that I've been writing online, I've both created and read more articles on the topic than I can remember. A lot of fantastic work has been done on the topic, from developing effective habits to complete systems that manage your day via observable, measurable actions and progress.

I'm not writing about those things.
I'm writing about the invisible.

When I use my Mac to get work done, there are unseen things. Habits, shortcuts, utilities and software that are such an intimate, rote aspect of my workday that I'm barely conscious of using them. In this article, I'm going to share those invisible things with you. Here is what I can't compute without.

Software

Alfred

Alfred is literally the first thing I install on any Mac I must use. It's so supremely useful, and such an effective time-saver, that it feels like a part of the OS. I have used Alfred since its 1.0 release, and I've never gone back.

> Let's say you own a small business and must produce a boilerplate email to customers who write requesting certain information. The response is just three short paragraphs long, but the time spent writing it over and over adds up.

It's more than an app launcher, though it does that's how I use it most often. Just pick the keyboard shortcut you'd like to use to invoke Alfred (I use Command-Space) and a tidy window appears. Start typing the name of the app you're after and a list of suggestions appears, each with an associated keyboard shortcut. For example, in the screenshot below, I need only to hit Command-2 to launch Slack. Do this several times per day and the time you save adds up quickly.

As I suggested earlier, I do this so habitually that it's almost subconscious for me at this point. I can type "Command > Space > M > Return" and have Mail launched in less than a second.

But app launching is Alfred's least impressive trick. Purchase the optional Powerpack (£17.00) to unlock a whole host of useful features, like:

- Browse clipboard history;
- Control iTunes;
- Search the web;
- Search your Mac.

Even that's the tip of the iceberg. The Powerpack lets you write complex workflows -- no coding required -- that carry out tasks for you with just a few taps on the keyboard. You'll find **an extensive repository of workflows online** that you can download and install.

As I said, Alfred feels like part of the OS to me, and saves me untold amounts of time. As does this next selection.

TextExpander
TextExpander is a utility that lets you replace one string of text with another. I realize that does **not** sound sexy at all, so let me explain.

Let's say you own a small business and must produce a boilerplate email to customers who write requesting certain information. The response is just three short paragraphs long, but the time spent writing it over and over adds up. TextExpander lets you define a brief string of text, say ".response" that is immediately replaced with the the boilerplate email. Use it once and you realize: this is magic.

> The first is likely my top productivity tip: silence the alert that announces the arrival of a new email message.

As the shock of that realization fades, the full power of TextExpander dawns on you. I use my copy to:

- Replace commonly misspelled words;
- Replace the surnames I often get wrong;
- Add a lengthy URL when I need to;
- Reduce the potential for human error when pasting complex code.

Just like we saw with Alfred, TextExpander offers advanced features that make it even more useful. For example, you can opt to have it place your cursor at any point in the resulting copy, or produce an input text box that will inject its contents at a desired location in the result.

Habits

In addition to the software, there are several habits I've adopted. The first is likely my top productivity tip: silence the alert that announces the arrival of a new email message. Few people can resist the siren song of an unread email. Unless your job requires constant attention be paid to incoming mail, turn that chirp off. It's a distraction engine. Speaking of...

Use the Do Not Disturb feature of OS X's Notification Center. I've dubbed it "Distraction Center," but perhaps that's unfair, as it can be quite useful. However, when it's time to buckle down and work, that's not the case. Simply move the toggle switch to "On" and get some stuff done.

Next, learn keyboard shortcuts and use them. No, it doesn't take a lot of time to move your hand from the keys to the mouse, but over time it will definitely make you less efficient.

As I said, there are a myriad of ways you can be more productive with your Mac, from the elaborate to the subtle. I recommend taking the time to develop useful habits that become an essential and effective part of your daily routine. That become invisible.

Artwork: ideeconcept,pl / apps icons

Steve Jobs

- this is not a movie for Apple fans

Krystian Kozerawski

Aaron Sorkin's "Steve Jobs" seemed to be doomed almost from the beginning: problems with finding the right actor for the starring role (big names were changing like they were in a kaleidoscope), the entire project being sold by Sony to Universal, and then a bunch of critical reviews from popular technology writers. When finally released, the film flopped spectacularly and was dropped from about 2000 theaters by Universal after its poor box-office performance. According to some of my colleagues and Twitter followers, the film was so boring they felt like leaving the theater.

I entered my local multiplex being aware of all this and was afraid of what I was going to see. To be honest, I could agree with all of those negative opinions, watching the film from a perspective of people who didn't like it and being aware of their expectations and attitudes. I am of the opinion that the missed expectations and attitudes toward the movie, screenwriter, and director were behind many of the negative opinions and led to the flop.

Comparing both the Stern and Sorkin films in terms of accuracy and sticking to facts reveals that the latter movie comes out badly.

It is worth putting this production in a wider context of other works about Steve Jobs' life that were released in recent years after his death. These works started with the official biography by Walter Isaacson and "Becoming Steve Jobs" by Rick Tetzeli and Brent Schlender - a great study of forging a top business leader from a chaotic, self-centered and selfish hippie - and ending with films like "Jobs" by Joshua Michael Stern (starring Ashton Kutcher) and the documentary "Steve Jobs: Man in The Machine".

Both books were a deep analysis and detailed description of his life, or at least part of it. Both are a compendia of knowledge about Steve Jobs and his life, painting his psychological portrait and describing how he was changing. To me, Joshua Michael Stern's movie was kind of an illustration to the official biography. It faced massive criticism, for sure, but despite some details known mostly to people pictured in that film, it stuck to the events as they were described in the biography.

Comparing both the Stern and Sorkin films in terms of accuracy and sticking to facts reveals that the latter movie comes out badly. Another important point was the acting of Ashton Kutcher, who became almost a dead ringer for Steve.

Over the last two or more years there was a lot of news about the support that Aaron Sorkin got from Walter Isaacson, Steve Wozniak and even from Lisa Brennan-Jobs, Steve Jobs' first daughter. All that buzz suggested that the movie was going to be presenting the life of Steve Jobs in an honest and accurate way and that expectation was built up in the media. Although the movie was going only to show a few important moments in the life of Jobs — just before showing the first Macintosh, NeXT Cube and first iMac — almost everybody expected they would be presented honestly with deep attention to details.

Another important factor was the expectation towards the screen writer - Aaron Sorkin - who was well known from writing the screenplay for "The Social Network", a film portraying Mark Zuckerberg and the beginning of Facebook. Fans and foes of Apple were waiting for another film of this type and "Steve Jobs" definitely was not. Indeed, both those who liked and despised Jobs could feel disappointed in the movie.

Facebook is in many ways much more personal to people than Apple, and it has more users than all Apple products do. Even people who don't have Facebook accounts know the service and its founder. I would say that people know Apple less well. They know who Steve Jobs was, but it is Facebook they are logging into every day no matter what kind of device they use. And to be even somewhat brutal, Mark Zuckerberg is still alive, and Steve Jobs passed away four years ago. So audiences were attracted to theaters to see the story behind the service they are spending their

lives on or to affirm their belief that Facebook is evil.

"Steve Jobs" is something completely different from the expectations people had for the movie. The life of Steve Jobs and the biography based on it is only an inspiration, and the screenplay is only loosely based on facts. For example, it's worth mentioning Joanna Hoffman (the daughter of famous Polish film director Jerzy Hoffman). She worked for Apple and Steve Jobs for just a few years as a PR person on the original Macintosh team. In the movie Hoffman - portrayed by Kate Winslet - assists Steve Jobs from the first Macintosh presentation, through the NeXT episode and ending with the introduction of first iMac. Sorkin turned Hoffman into just a fictional character. In all of those important moments, Jobs did have a PR woman next to him but first it was Joanna Hoffman, then at NeXT it was Allison Thomas and finally, after his return to Apple it was Katie Cotton. Sorkin was apparently inspired a lot by how Allison Thomas dealt with Jobs. However, this film is for people who won't be complaining about details like how long Hoffman was actually Jobs' PR person or if those scenes with Wozniak, Hertzfeld and Sculley actually took place.

In this case the facts are a distant second, for this film is a psychological drama portraying a person who is both chaotic and perfectionist at the same time. Jobs was a person who rejected and hurt all the people that were close to him, but they are not going to efface themselves and go out of the camera frame. On the contrary, they confront his selfish, self-centered ego. The fictionalized characters of Steve Wozniak, Andy Hertzfeld, Lisa (Steve's daughter) and her mother Chrisann Brennan, and John Sculley are in fact a mirror that the main character looks into, and he does not like what he sees.

Aaron Sorkin tries to deal with the quite common opinion that Steve Jobs created no single thing and that he used or exploited others, their great ideas, and their hard work.

The movie "Steve Jobs" is not just a psychological portrait of the main character, as it is not only Jobs who at the same time rejects and needs the people who are around him. Those people need him as much as he needs them, and this is the kind of relationship that those people cannot break. Aaron Sorkin tries to deal with the quite common opinion that Steve Jobs created no single thing and that he used or exploited others, their great ideas, and their hard work (as an example, the fictional scene with Wozniak before the NeXT introduction).

Michael Fassbender's physical resemblance to Jobs is not an important factor, and he is great as a fictional Jobs. I say fictional, since this film is not about the real Steve Jobs but just an artistic creation. In my opinion this is why the movie failed, and I can understand the complaints of people who knew the real Jobs, including his wife. Sorkin did with the story of her husband what he wanted to do.

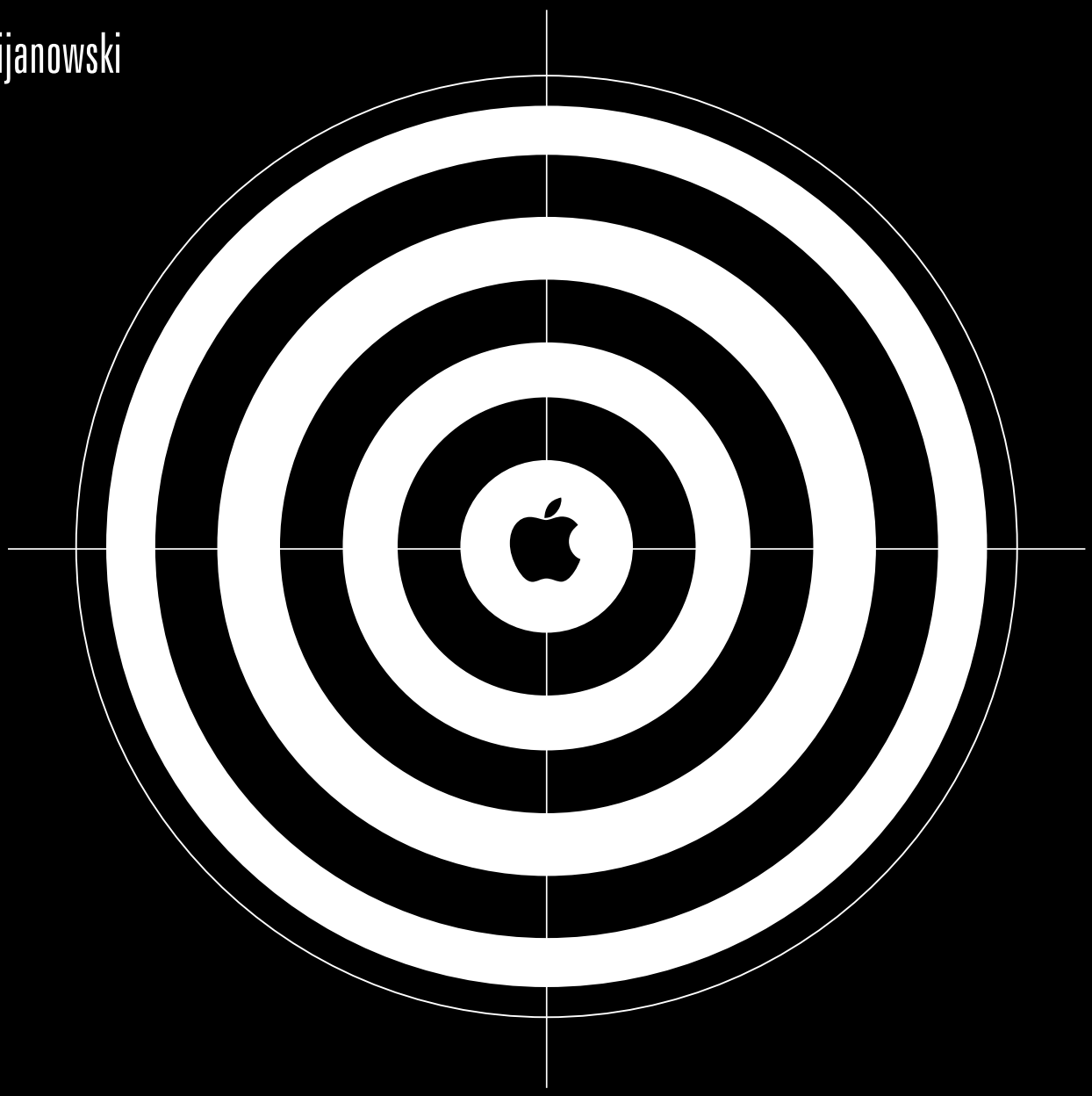
I am of the opinion that Sorkin's screenplay would be an excellent theater production. In fact, while watching this movie in an empty cinema I felt like I was in a theater with a real stage and live actors in front of me. I would love to see this story on stage with almost no sets, just the empty, dark stage, the actors, and a table with a Mac on it.

Photo: part of official movie poster from Universal Studios

Pegatron

- The darkest place is under the candlestick

Max Pïjanowski



There is a Philips TV in front of you. You turn on your PlayStation 4 and put the gamepad on the couch, at the same time looking at your smart watch. Yes, you didn't notice that a few hours had passed. You grab your Surface tablet to check how many likes you got for your latest selfie taken with a Motorola smartphone. Incidentally, you notice a post shared by your friend: "Pegatron fakes data. Workers have to work over 60 hours per week". Unfortunately, your battery has died and prevents you from reading the article to the end, but you know that this article referred to Apple, and you hate this company. So before you grab your Kindle, you read the rest of the story on your HP laptop. Now you know that you can sleep tight, for you chose your devices wisely, rejecting those that Apple manufactured under inhumane conditions. OK, time to wake up.

Thanks to a report recently prepared by China Labor Watch, I came back to the topic of poor work conditions in the factories of the manufacturers of Apple products. An audit made inside of the Pegatron facility in Shanghai where iPhones and iPads are manufactured revealed that 58% of the employees work over 60 hours per week and therefore over the limits set by Apple. Officially, overtime is voluntary, but in reality it is obligatory due to the both low wages paid to workers and the demands of the employer. According to China Labor Watch, the documents concerning working conditions and work hours that suppliers have to show to Apple were faked by Pegatron. The workers were forced to sign declarations of completing 24 hours of obligatory safety courses, when in reality the courses were three times shorter. The workers were also provided with the answers for the obligatory test they had to pass.

It was partially recorded with a candid camera in order to show the work conditions on the Pegatron iPhone production line with employees falling asleep due to enormous fatigue. It is hard to be surprised at this; despite having used an iPhone for many years, I would probably also fall asleep after spending dozens of hours watching and testing them.

According to China Labor Watch, this wasn't the first time manufacturing workers have been subject to poor work conditions. During audits conducted from March to July 2013 in Pegatron and Riteng factories in Shanghai and Avy in Suzhou, employing over 70,000 workers altogether, China Labor Watch revealed 86 different forms of workers rights abuse, including overly long shifts, low wages, managers not respecting contract details and the rights of women, employing underage workers, poor accommodations, and poor working and safety conditions as well as a lack of health care, exposure to environmental pollution, and problems with getting holidays and days off. There were even cases of bullying that occurred. Thanks to interviews with about 200 former and present Pegatron employees, one can find out that after a long shift workers return to their dormitories where they sleep in a room for twelve people and have to wait in long queues to take a quick and cold shower. One can find out that there are even cases of abuse of the 8 hour daily work limit for pregnant women.

Probably the most talked about exposé was the BBC One documentary called "Apple's Broken Promises" that was broadcast in late 2014. It was partially recorded with a candid camera in order to show the work conditions on the Pegatron iPhone production line with employees falling asleep due to enormous fatigue. It is hard to be surprised at this; despite having used an iPhone for many years, I would probably also fall asleep after spending dozens of hours watching and testing them.

The reports mentioned above have fixed in the minds of the public the picture of Pegatron as an Apple supplier trying to exploit its employees in every possible way. As a matter of fact, Pegatron is a supplier to many other brands of consumer electronics in addition to Apple.

Pegatron was founded in 2008 as a result of splitting Taiwanese Asus into three separate companies. Pegatron is one of many ODMs (Original Design Manufacturer) - companies that manufacture products for other brands. In this case it manufactures logic boards, graphic cards, laptops, smartphones, tablets, game consoles, TVs and set top boxes. Not all of the products are Macs, iPads or iPhones. So linking Pegatron's abuse of workers only with Apple is very convenient for other brands. They stay in the shadow of the company from Cupertino and thus they can avoid accusations of exploiting workers. Since each such publicized scandal concerned Apple, the other manufacturers have been lucky staying out of sight.

Do you prefer PlayStation or Xbox?
Doesn't matter, since both of them — including present and past generations — are manufactured by Pegatron.

Do you prefer PlayStation or Xbox? Doesn't matter, since both of them — including present and past generations — are manufactured by Pegatron. Although the game consoles are not as popular as smartphones, they sell in dozens of millions. In an interview for Edge magazine in July 2015, Phil Spencer - head of Microsoft's Xbox division - said that in the 18 months after the release of Xbox One, the Redmond company sold more of the new consoles than Xbox 360s, meaning over 11 million. Sony boasted that it had sold 25.3 million Playstation 4 consoles when it presented the results for the end of second quarter of 2015. Is there anybody who is going to write about the working conditions of the workers assembling them? No, because nobody cares. The main target of complaints from China Labor Watch and the media is Apple.

All of the devices mentioned at the beginning of this article are made by ODMs. Pegatron assembles computers for HP and manufactures Microsoft's Surface tablet. Philips TVs are now entirely made by the Chinese firm TPV Technology. Kindle e-book readers, Motorola smartphones and some game consoles are assembled in factories owned by Foxconn - a firm that could be the topic of a separate article and which is strictly identified with Apple. People seem to forget that Foxconn manufactures 40% of all consumer electronics in the entire world.

Despite Pegatron and other ODMs doing work for companies other than Apple, the Cupertino-based company is accused of any and all abuses revealed during audits. Apple is one of a few companies that actively try to engage in attempts to improve working conditions in supplier factories by setting limits, trying to enforce regulations, conducting their own audits and publishing annual reports. This effort is achieving some positive results, but it isn't enough to avoid continuing to be accused of exploiting workers in Chinese factories. There is some good that comes from this — according to China Labor Watch, media coverage has increased awareness of consumers and led to improved work conditions in both Pegatron and Foxconn facilities. If only the media targeted not only Apple, but the other brands as well, there could be even more improvement.

Artwork: ideeconcept.pl

Magic Cap:

The Mobile Operating System Nobody Remembers

Steve Sande

Having been a mobile device fan since forever, I've owned and used some devices that have fallen by the wayside. I had a lot of different Palm devices — from the original 3Com Palm Pilot to the "connected" Palm VII and Palm i705. Windows Mobile/Pocket PC devices? Yep. Of course, being a fan of Apple, I owned just about every model of the Newton MessagePad at one time or another. But the most unique device I ever owned was a Motorola Envoy, a wireless device that ran the Magic Cap mobile operating system.

For Mac users who have been around a while, the Magic Cap user interface was most reminiscent of a HyperCard stack. In Construction Mode you could even write scripts that were similar in structure to HyperTalk to perform actions for you.

The company that developed Magic Cap was General Magic, a company with a lot of Apple heritage. Bill Atkinson and Andy Hertzfeld, along with investor Marc Porat, founded the company to develop a "personal intelligent communicator" or PIC to focus on communications. Tony Fadell, often considered the father of the iPod and founder of Nest (and now working on future versions of Google Glass), was the engineer and architect of the devices that used MagicCap. Of course, this was all at the beginning of the mobile phone age in the early 1990s, so communications was going to be either be over radio or a phone cable.

Magic Cap was — as far as I know — only implemented on two commercial devices; the Envoy and a "regular" PDA called the Sony Magic Link. What made the operating system so unique was the room metaphor it used rather than the more familiar desktop. For example, you had an office in which there was a wall clock displaying the current time, in and out boxes on the wall for messages that had come in or were waiting to be sent, a desk and a file cabinet.

On the desk you'd find common items like a fax machine, a Rolodex (contact list), a pen and post card (for sending messages), a notebook for taking notes, and a calendar book. Drawers on the desk, when tapped with a stylus or finger, contained such items as virtual envelopes and stationery and a simple calculator.

There were other "rooms" that were around, available via a "hallway". One room was where you'd clean up system files, and as I remember it, the hallway actually had pictures you could put on the walls.

For Mac users who have been around a while, the Magic Cap user interface was most reminiscent of a HyperCard stack. In Construction Mode, which I'll discuss later in this article, you could even write scripts that were similar in structure to HyperTalk to perform actions for you.

About the same time that Motorola came out with the Envoy, they were also marketing a device called the Marco. The Marco was a Newton device that came out in early 1995 and featured a built-in ARDIS network radio antenna so that the user could send and receive email and text messages wirelessly. Being that I was a huge Newton fan, you'd think that I would have gone with the Marco... but you'd be wrong. The Marco was really big in comparison with even the Newton Messagepad 2100 that came out a few years later, basically being a Newton with a radio transceiver attached. While cellular modems used in our devices nowadays are tiny, back in 1995 the transceiver was bigger than the Newton. It just seemed like a bad solution.

Although the Envoy was about as big as the Marco, the really unique office metaphor of Magic Cap really captured my imagination. So I ended up buying the Envoy. It was really a brick compared to the devices we're used to these days — 7.5 inches wide, 5.7 inches high, 1.2 inches deep, with a hinge between the device and the radio trans-

ceiver. It weighed a whopping 1.7 pounds with the battery installed.

I'll get to the details of the Magic Cap user interface in a minute, but first let me expound on why the Envoy — and ultimately Magic Cap altogether — failed. First, the microprocessors of the time simply couldn't handle the load of displaying graphics and doing other things, so the device (which used a Motorola Dragon I/68349 microprocessor) was deadly slow. Second, the system used the ARDIS wireless data network. You know how we currently refer to LTE Advanced data networks as 4G? ARDIS was the marketing name for Motorola DataTAC, a 1G (first generation) data network. It ran at 19.2 kilobits per second on the 800 MHz band — not very fast! Well, ARDIS was also very expensive. After sending a few short emails to friends, I was shocked when I received a $150 monthly bill after the first month. A friend in the Denver area who also had one of the devices had an even worse situation, running up $400 in charges. We learned very quickly to really limit our wireless usage, which of course was the main reason we had purchased the devices!

> … the real killer for Magic Cap was that with so few devices out in the wild, nobody wrote any apps and the devices were limited to the few applications that came with the devices. In addition to the normal desk accessories that came with the device

Third, the devices had miserably bad battery life. It was common for me to use the device without the radio on and have it last about an hour. I think part of this was due to the Magic Cap OS insistence on using sound effects for everything. Using the devices in a quiet room for a meeting was embarassing, since the constant litany of beeps, boops, slurps, tapping noises, and so on was very distracting.

But the real killer for Magic Cap was that with so few devices out in the wild, nobody wrote any apps and the devices were limited to the few applications that came with the devices. In addition to the normal desk accessories that came with the device, there were apps for recording voice messages up to 20 seconds, AT&T PersonaLink Services which were supposed to allow for shopping for goods and services, RadioMail for messaging, AOL for communication with other AOL users and getting stock quotes, the OAG (flight and fare information), and a spreadsheet and graphing package. That was it.

Magic Cap wasn't all about cutesy apps, though. The idea was that through a language/service called Telescript, developers would create "agents" that would do work for you. As an example, let's say you wanted to get reservations at a certain restaurant within a specific time frame. Rather than using an app like OpenTable to ask what time reservations are available at a restaurant, an "agent" would "ask" various restaurants in the area what time they had reservations open. You'd get a response with a list of restaurants and times, and could then respond with a tap to make your reservation. But none of the infrastructure required for these services ever appeared, so the Magic Cap agents were essentially unemployed…

For fans of the Mac, Magic Cap offered an even more graphically-oriented user experience than the Newton. In the era, the

idea of buying services on the device was pretty novel, so signing up for AT&T PersonaLink was exciting. You'd find a "postcard" from AT&T in your inbox when setting up the device, and tapping a button brought up a form. You'd fill out the form with the on-screen QWERTY keyboard, tap a send button, and the message went into the outbox. To mail it, you'd plug in a phone line and let it dial up a service to deliver the message, or on the Envoy, use the wireless modem and rack up a huge bill.

... the lack of handwriting recognition also seemed to keep the Magic Cap devices in the shadows, even with the lack of accuracy that characterized the early Newtons. It appeared at the time that to be considered a "high tech" device, a personal assistant needed to have handwriting recognition — even if it wasn't perfect.

Probably the most useful feature of the Sony Magic Link and Envoy was that dialing capability, as you could use the device — with a phone line plugged in — as a fast dialer using your address book or as a fax machine.

Anyone who tired quickly of the rather boring (and few) built-in apps could start playing with Construction Mode, which allowed users to get in and tinker with the user interface elements. You could do things like add your own sounds to buttons or create your own forms to send to others with Magic Cap devices. The last item was rather sad, since there were so few Magic Cap devices sold you really couldn't send those custom forms to friends. The only people they were probably useful for were the employees at General Magic.

Looking back on Magic Cap, I think it — like the Newton MessagePad — was ahead of its time. The technology just wasn't there for fast, lightweight devices with decent battery life that could access services through a relatively inexpensive and speedy cellular data plan. Oddly enough, the lack of handwriting recognition also seemed to keep the Magic Cap devices in the shadows, even with the lack of accuracy that characterized the early Newtons. It appeared at the time that to be considered a "high tech" device, a personal assistant needed to have handwriting recognition — even if it wasn't perfect.

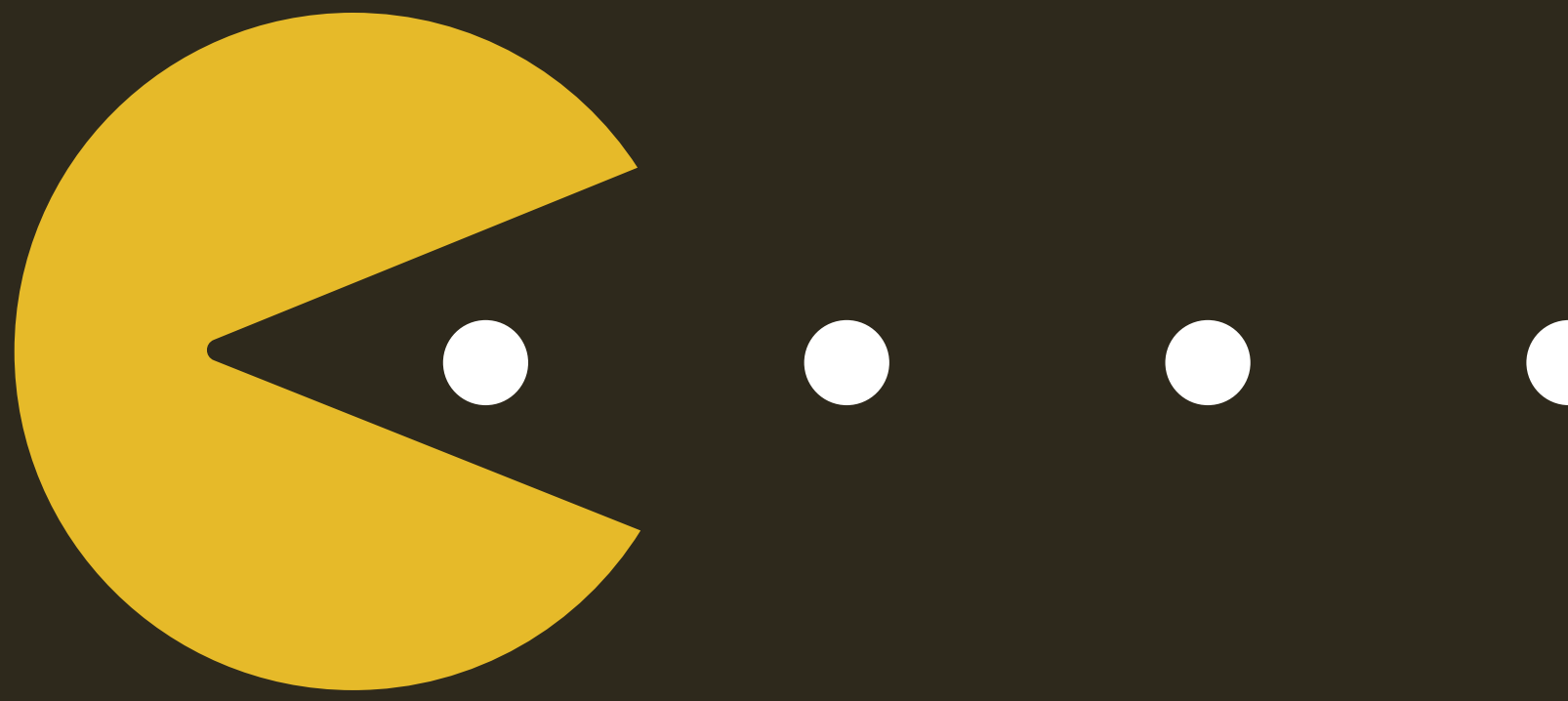
Some of the technology developed at General Magic was later used for a voice recognition based system called Portico that I remember trying, and for those who remember the GM OnStar Virtual Advisor for automobiles, that was a General Magic product as well. General Magic died in 2002, with Microsoft co-founder Paul Allen buying up most of the patents.

Magic Cap was impressive, although flawed from the start. However, every device and platform that we use today owes part of its user interface and capabilities to what the pioneers at General Magic had the vision to foresee.

Photos: General Magic Logo

Growing up with computers behind the Iron Curtain

Krystian Kozerawski



Last month Steve recalled growing up with computers in United States. Each of you has his or her own memories of the past and your first time with a computer, especially a Mac. And of course, I have mine. Well, they are a bit different to Steve's, due to two important factors. First, when he graduated from high school I was born (1974). Second, I was growing up in a bit different reality, about 5,300 miles away to the east and behind the Iron Curtain in communist Poland.

In the late 1970s and early 1980s, all the consumer electronic devices and appliances we had were a refrigerator, vacuum cleaner, black and white TV set, a monophonic radio and a reel-to-reel tape recorder. All of them were made by branches of the Polish state consumer electronic enterprise, Unitra.

Over the last 25 years, I've encountered many stereotypes and misconceptions about Poland during those years, and I was asked many more or less stupid questions based on those stereotypes. I was asked one of the first questions of this kind by an old English couple during my first trip to Scotland. I met them on the Isle of Arran, while sightseeing some ancient monuments. When I told them that I came from Poland, I noticed they were abashed. They started to behave a bit strange and I knew they were trying to ask me a question, but they were afraid. So I asked them: what do you want to ask me?

"Now, after communism has fallen, do you have electricity, radio and television?"

The other common stereotype about Poland of that time that I became aware of was that our society was made up of poor and sad people. Well, I don't want to defend the oppressing communist regime with its secret police, prisons and censorship. Of course there was a permanent lack of any goods — I remember myself walking as a kid with pride through the city with a cluster of toilet paper rolls slung across my chest; toilet paper was a good of a special importance and was in permanent scarcity — and there were blackouts quite often. But it wasn't sad and dull reality, at least not as much as some people in the west were taught.

I was born in 1974, and the first things I can recall are from 1976. My mother and I were living in a small apartment (you would call it one bedroom, but in fact the living room was my mother's bedroom, and a small bedroom was mine) in a blockhouse in Lodz (a city in the heart of Poland). It was a typical communistic living estate full of blockhouses and tower blocks made of concrete.

In the West such kind of areas were usually the poorest parts of towns and cities, but not in Eastern Europe. They were of relatively high standards compared to the old 19th century tenant houses in the city center, with central heating, gas, hot water, and a balcony. The communist regime, in an attempt to build its own utopia with a permanent lack of apartments, put into those blockhouses people of every sort, on every step of the social ladder. There was a thief, and a university professor, a musician from the city philharmonic orchestra, a dentist, a bus driver, a policeman and a teacher living next to each other. In fact, this kind of forced equality worked well, and even today those living estates are occupied by people of different professions.

In the late 1970s and early 1980s, all the consumer electronic devices and appliances we had were a refrigerator, vacuum cleaner, black and white TV set, a monophonic radio and a reel-to-reel tape recorder. All of them were made by branches of the Polish state consumer electronic enterprise, Unitra. There were some early color TV sets imported from the Soviet Union, called Rubins, but due to their poor manufacturing quality some of them blew up and caused fires.

The most important device was, of course, a TV set. At that time — in the late 1970s and 1980s — there were only two channels of state television. In the first year of martial law (1981), we had only one TV channel. Of course there was a lot of communist propaganda, especially on the main news program broadcast every day at 7:30 PM, but compared to other countries behind the Iron Curtain there were also a lot of Western productions on state TV. Those ran the gamut from Disney and Warner Bros cartoons through popular science documentaries to American serials and movies. The movies and serials were broadcast late on Saturday nights. American movies were also showing at theaters. One of the most iconic photos taken during first days of martial law in Poland in 1981 is photo by Chris Niedenthal showing Cinema "Moscow" in Warsaw with a big poster of "Apocalypse Now" on the front wall and the MPV's of the Polish Army securing the area.

> In 1983, I touched a real computer for the first time in my life. I played games on a Commodore 64, a computer made by a company founded by a man who had grown up in the same place where I was spending weekends and who had survived that ghetto — Jack Tramiel.

With one, two or sometimes three years of delay after their release in the U.S., many American movies were shown in Poland. I remember as a kid watching E.T., Star Wars episodes IV, V and VI, Raiders of the Lost Ark, and Back To The Future as well as TV films like "The Day After" (about a nuclear apocalypse). In the mid-1980s, when personal computers were already present in Poland, we even saw a cult film for many hackers, geeks and nerds - "WarGames".

Coming back to TV, apart from American films being shown there were a few very interesting popular science programs. One of them, on channel 2, was "Kino Oko" (Cinema Eye), presenting interesting documentaries about nature, science etc. The other one, titled "Sonda" (in English, "a probe"), was the best popular science program in the history of Polish television. During 12 years (usually every Thursday evening), the duo of economist Zdzisław Kamiński and physicist Andrzej Kurek presented one particular topic or problem of popular science. It was a cult series for the entire Polish population. Unfortunately, it ended unexpectedly with the tragic death of both hosts in a car crash.

In the beginning of 1980s it was on "Sonda" where I saw a computer for the very first time. There was an episode about personal computers, and how they could be used in offices, in design and entertainment. Although as a kid I found it interesting, I didn't instantly become a computer fan. A year or two later, during the summer, a magic caravan stopped on the spacious parking site just a few blockhouses away from my place. Inside there were pinball machines and one arcade game - Asteroids. I was sold!

From that day on I spent every penny I got from my mother for that game. A few months later the owner moved from the caravan to a small house, setting up an arcade. There were more games, like Defender, Moon Patrol, Donkey Kong, Pac-Man and a few others. Every day after school, kids occupied this small building, not only playing but also watching games, decades before Twitch appeared. That

game arcade was a place of magic, but also it was a bit dangerous. Sometimes, the older kids were literally robbing the younger ones of money.

Meantime, the first 8-bit computers were brought from the West to Poland. In 1983, I touched a real computer for the first time in my life. In the middle of Baluty district of Lodz — a former ghetto of Litzmannstad (that's what Lodz was called during WW2) — I played games on a Commodore 64, a computer made by a company founded by a man who had grown up in the same place where I was spending weekends and who had survived that ghetto — Jack Tramiel. It's worth mentioning that a few years earlier Commodore was the company interested in buying Apple, and even Steve Jobs was ready to sell it.

Next year, a small computer club opened in one of cultural centers. I attended a meeting every Monday. At that time there was only one Sinclair ZX Spectrum Plus, a black and white TV, and a clunky Polish cassette recorder, ironically called a Data Recorder.

Well, it was not my C 64. I could only touch it once a week during a BASIC programming course. To be honest, I was attending not to learn programming, but to play games. The first hour was a programming course, and next 30 minutes was for playing games. Imagine ten kids and one computer. 50 minutes spent on a bus one way was worth it for a short time of magic.

Next year, a small computer club opened in one of cultural centers. I attended a meeting every Monday. At that time there was only one Sinclair ZX Spectrum Plus, a black and white TV, and a clunky Polish cassette recorder, ironically called a Data Recorder. Loading games took a few minutes, and many times it was interrupted with a "tape loading error" message. But those games with their 256 x 192 pixel graphics were real magic! We played titles like Manic Miner, Jet Set Willy and Knight Lore.

The other place I could at least watch computers working and games being played was at a small computer fair. In the beginning, it was a place where one could buy pirated software, but later there were computers for sale, too. It's worth mentioning that due to the COCOM embargo, no modern technology was allowed to be officially exported to Eastern Bloc countries. So all computers were brought, and many times smuggled, into Poland by ordinary people.

In the mid-1980s, the communist party and the government realized that the computer revolution could not be stopped and could actually move a undeveloped country a bit forward. The first computers started to appear in shops. The Timex 2048 computer (an American ZX Spectrum clone) was available via a Polish chain of scout shops. That was funny -- you could buy a rucksack, boots, a tent, a boy or girl scout uniform, and a computer.

One could also buy Atari XL/XE computers with peripherals (tape recorder, disk drive, printer) at special dollar shops called "Pewex". That chain was a kind of an alternate reality in a country suffering the worst economic crisis in decades. It was hardly possible to buy quality food or other goods in the shops paying with Polish Zlotys. A com-

mon picture of that time is of completely empty shops and supermarkets with nothing on the shelves. However, the black market was very strong and there were dollar shops full of all sort of goods. In my granny's neighborhood there were three of them. One was a grocery store with all of the typical Western world sweets, cans of Coke (in the 1980s, Coke was only available in regular shops in Warsaw and Katowice; in Lodz and other parts of Poland one could only buy Pepsi), Mars bars and even canned Polish ham that was usually exported from Poland. At that time, a real chocolate bar was a luxury — you could find only bars made of something that vaguely resembled chocolate — so my nose was often stuck to the front window of that dollar grocery store. The second shop was filled with cosmetics and toys, with plenty of Lego sets. And the third was a radio and television shop full of stereo and TV sets as well as Atari computers.

In 1985-86, Polish computer magazines began to flourish one by one. Some of them were printed in greyscale on paper of the lowest possible quality, but were full of small listings of the code of BASIC programs

You could get all of those things by paying in dollars, British pounds, French francs or German marks. There was even a special Polish alternate currency with special banknotes issued by the Polish national bank worth 1, 5 or 10 dollars. That radio and television dollar shop was the place where my mother bought me my first computer — an Atari 65 XE. It's worth mentioning that the official import of both Timex 2048 and Atari XL/XE didn't break the COCOM embargo. In 1986, both computers were already a bit outdated, but they let Polish computer fans not only play games, but start programming.

Unfortunately, my mom could afford only a computer without peripherals, so I spent the next three or four months retyping BASIC programs from the available computer magazines. My favorite one was a simple clone of Breakout. Written in BASIC and machine code it took me about an hour to retype it into my Atari. When I got a dedicated cassette player for data storage, I was almost in heaven.

Together with American movies in the theaters, on TV or on VHS tapes — VHS players became popular in the mid to late 1980s — those computers were a sparkle of the Western world. Despite the official state propaganda presenting theSoviet Union as our first and biggest ally, people were watching Rambo and Rocky IV, and playing games like Green Beret or Raid Over Moscow (that one presented the Soviet Union as one big military camp with watchtowers and barbed wire fences). By that time there were thousands of great games available, copied from one disk or cassette to another. New technology like computers or VHS players were a luxury. Having the tech wasn't seen as an act of resistance, and computers were in use by both sides including the communist regime.

In 1985-86, Polish computer magazines began to flourish one by one. Some of them were printed in greyscale on paper of the lowest possible quality, but were full of small listings of the code of BASIC programs. Others were full color and tabloid size, printed on a much better paper, but not the best — the best quality thick paper was reserved for a propaganda magazine that was used to promote the Soviet Union among Polish society (remember, Poland was not a part of Soviet Union, it was a satellite country). After a few months, only two computer magazines

survived — "Bajtek" (the diminutive of the word Byte) and "Komputer". While the first one targeted teenagers and the latter more advanced and mature users, both were read by all computers fans in Poland. And it was hard to get them - the circulation was rather low due to the permanent lack of everything, including paper and ink, in a failing communist state, so I usually had to search for each issue throughout the city, checking newsagents one by one.

Despite being years behind the West, Poland had some interesting computer projects that were ahead of their time. One of them was a special multimedia vinyl album from one Polish pop band. Yes - a multimedia vinyl. The last track recorded on it was the sound of a program for the ZX Spectrum. After connecting a record player to a computer, one could load a simple application presenting the musicians of the band. There was also a radio show called "Radio Komputer", during which programs for ZX Spectrum, Atari and Commodore were broadcast over the air. Having a radio-cassette recorder, one could record them and load them on your own computer.

In this reality, Apple computers were almost nonexistent in communist Poland in the mid 1980s. There were a few brought or smuggled from the West, but the quantities were so low that almost nobody knew anything about them. I got know about them not from Polish computer magazines, but through some popular American news magazines.

In 1986, the husband of my mother's friend came back from a trip man the United States bringing with him a lot of stuff, including a pile of Time and Newsweek magazines. Since I could speak and read very little English at that time, I was just looking at pictures and ads. There were advertisements for Apple machines like the Apple IIc and Macintosh and I wondered "what are those strange machines, and what does that Apple mean?" (despite knowing that English word). The same year I got know more about the computers and the company thanks to a few rather rare articles and publications. One of them was a book titled "Personal Computers" that presented all aspects of the industry including computers, peripherals, operating systems and programming languages. In that book I finally read more about the Apple IIc, Apple IIGS, Lisa and Macintosh.

Unfortunately, Macs were out of reach for most computer fans in Poland. They cost a fortune, not only in the late 1980s, but in the 1990s too. A few DTP studios, publishing houses and media agencies got Macs, but even for them it was a lot of money to spend. To get the money to buy a proper Macintosh, one would have to sell an apartment. Today it's an urban legend, but the price of Macs in Poland was really unbelievably high.

At the beginning of the 1990s, I could afford only the Atari ST, a 16-bit computer based on the same Motorola 68000 processor as the Macintosh and equipped with a graphical user interface similar to the Mac. Once again, I was using a computer made by a company owned by my local compatriot, Jack Tramiel. As many other Poles who emigrated or fled to the USA, he changed his surname to make it easier to pronounce in the English-speaking world (he emigrated to the USA after World War II). Before that, his name was Jacek Trzmiel, with "trzmiel" being a Polish word for bumblebee. The bumblebee was an element of the Atari ST's operating system GUI. It was equivalent to the old Macintosh watch icon or the modern Macintosh beachball, and it was a great -- albeit subtle -- reference to his roots.

For my own Mac, I would have to wait many more years.

Artwork: ideeconcept.pl - based on Pac-Man game

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