



## Responsible development and use of mobile AI

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The possibilities of smartphones with AI capabilities (“intelligent” phones) are endless. Equipping smartphones with AI chips provides faster processing and longer battery life, and adding effective machine learning abilities will enable the phones to adapt their operating systems to users’ habits, tastes, and interests, thereby expediting more efficient and impactful use of mobile technology. And the leading phone companies and chip makers are already in the process

of making such advanced mobile AI a reality.

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AI and its use in mobile technology are on the verge of reaching a technological tipping point, with tremendous potential for making revolutionary impact on humanity. And we have the power and responsibility to ensure that those effects of mobile AI are positive.

Mobile technology, dating back to Motorola’s first DynaTAC model in 1973, and its recent accelerated advancements have fundamentally transformed our lives. The mobility and increasingly lowered price of mobile phones have enabled people to communicate with the rest of the world without being tied to physical locations, thereby facilitating business growth and accelerating globalization. And a bigger breakthrough came in 2007, when Steve Jobs introduced the iPhone.

The iPhone and other smartphones, especially after being equipped with AI assistants (e.g., Siri), led to increased efficiencies and synergies, revolutionizing the way people communicate, do business, and live. It is important, however, to recognize the unintended negative consequences that resulted from the use of smartphones and associated technologies, such as new and increased health risks

(e.g., “smartphone addiction,” insomnia), rapid decline or demise of industries and companies, and greater socio-economic instability. Learning from the positive and negative effects of smartphones and mobile AI on humanity thus far, as well as studying the future trends of mobile AI, will help us benefit from mobile AI in the future, while ensuring that socio-economic damage is minimized.

### The ubiquitous possibilities of advanced mobile AI

The possibilities of smartphones with AI capabilities (“intelligent” phones) are endless. Equipping smartphones with AI chips provides faster processing and longer battery life, and adding effective machine learning abilities will enable the phones to adapt their operating systems to users’ habits, tastes, and interests, thereby expediting more efficient and impactful use of mobile technology. And the leading phone companies and chip makers are already in the process of making such advanced mobile AI a reality. For example, the new A11 Bionic chip installed in Apple’s latest iPhone X includes a “neural engine” that is specifically designed for machine learning. The A11 Bionic chip enables AI features and

applications, such as face recognition, voice recognition, and augmented reality, with extraordinary processing power, performing up to 600 billion operations per second. Likewise, Huawei recently developed a new Kirin 970 chip equipped with AI capabilities via a “neural processing unit” (NPU), and Samsung is also in the process of adding AI-specific CPU cores into its mobile chips. Such AI chips, NPUs, and effective machine learning abilities are forecasted to become the norm in mobile technology, helping “intelligent” phones to better predict the users’ needs, perform the desired activities more efficiently, and assist the users in making more informed decisions.

In addition to “intelligent” phones, it is anticipated that there will be a surge in the development and use of “intelligent” apps in mobile technology. Application of AI and machine learning abilities in apps essentially allows AI to potentially permeate every aspect of our lives, depending on the apps we decide to install on our phones. There are already several examples of AI-powered apps that recently entered the market. For example, MyKAI provides an AI-powered chatbot that helps manage and track the user’s money. Another app, named Talla, serves as an assistant that

# Artificial Intelligence (AI) Goes Mobile

automates answers to internal questions submitted by employees of a company and manages and prioritizes work requests. There are many other examples of AI-empowered apps, including those that are already widely-used, like Facebook Messenger, as well as relatively newer ones like Focuser, Time, Memrise, Duolingo, and so forth, each focusing on helping users in different ways.

The use of intelligent phones and apps also have great potentials for helping better humanity on a broader scale. For example, there are currently initiatives that use mobile phones for health-related services, such as for diagnosis, disease monitoring and compliance, expert assistance, and promotion of awareness, especially in countries experiencing deficits in doctors. These initiatives, however, are still at relatively nascent stages due to the present technological limits in mobile technology. Similar efforts can become more effective and grow exponentially once mobile AI technology reaches a point of being able to provide reliable and accurate medical inspections, analyses, and diagnoses. This can lower the average medical costs for the public and provide them with greater access to healthcare (especially in countries experiencing deficits in doctors). This is attributable also to the smartphones' nature of being widespread, portable, easy to customize with special-purpose applications, and connectable to diverse devices (e.g., sensors, blood pressure monitors). Thus, continued development of effective AI and pairing of intelligent phones and apps provide endless possibilities for positively impacting humanity, ranging from providing AI assistants that help people perform various tasks to AI medical apps that can have widespread impact in providing cheaper and more widespread medical services to various populations.

Ensuring a bright future with responsible development and use of mobile AI  
The potential for making disruptive positive impact with mobile AI is growing at an accelerating rate, propelled by exponential technological advancements in AI and machine learning, as well as quickly decreasing costs for producing powerful chips. But that potential also comes with risks that were unintended and often unforeseeable, such as job loss, unequal distribution of wealth, improper access to and use of personal information, and negative health effects. And the fact that the technological innovations are progressing at an unprecedented speed also means that the negative consequences are likely to be more unpredictable, occur more quickly,

and have broader impact. It thus is crucial that governments, tech companies, entrepreneurs, and consumers meaningfully discuss, research, and create policies to ensure responsible development and use of mobile AI, to help better humanity and minimize the associated risks. Further, it is equally important for these different sectors to prioritize learning about the relevant technologies and to keep an agile and flexible mindset, so that the necessary safeguards not only can be timely established, but also timely adjusted and corrected, in response to the rapidly evolving AI technology.



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