

Is There an App for That?

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Abstract—An ever-increasing number of apps on our phones promises to help us lead better (healthier, happier) lives. From stress-reducing “focus” apps to exercise-inducing fitness apps—one soon wonders how we could ever live without them! Yet, are our smartphones the solution, or are they the problem? And what does that mean for smart wearables, such as smart watches and smart glasses?

■ I RECENTLY CONSIDERED getting a smartwatch. After years of pulling out my phone to check the time, the idea of simply glancing at my wrist to know if I am running late filled me with giddy anticipation. Obviously, having an always-on display sounded like a must here, in order to avoid any sort of wrist shaking in order to activate an otherwise dormant watch face. Yet, when browsing the list of latest models in the space, I quickly realized that telling the time was only a fraction of what such a gadget could make possible for me. Obviously, being a smart watch, it would be able to also alert me to any notifications appearing on my phone, or even take phone calls directly on the watch. Yet, most models also include a wealth of sensors that promise to not only count my steps, measure heart rate, and detect what type of activity I am engaged in (e.g., running or cycling), but can also detect falls and irregular heart rhythms, or monitor my sleep. In fact, most of these features (except maybe heart rate measurements) are also available on today’s smart phones, with countless apps promising to

help me detect sleep problems or help me exercise more.

MY LIFE, DIGITAL

Whether using a smart watch or simply a smart phone—with the right apps, it seems much of my life can not only be tracked but, through proper analysis, be improved. A quick search shows that both the Apple Apps Store and Google Play list over 40,000 “mHealth” app publishers each, with hundreds of thousands of corresponding apps available for download. The majority seems to be revolving around fitness, dieting, and meditation, though many other popular areas are evident, such as allergy management, women’s health, smoking prevention, or general health advice. In addition, many apps within the “productivity” category similarly aim to help me focus or otherwise manage my tasks. Obviously, these tools can also often run directly (or additionally) on a laptop, where they can be better integrated into one’s workflow.

Productivity can be equally helpful outside the office—there are apps for coordinating families (e.g., shopping, school pickups), finding relevant news and/or events, or staying in touch

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with friends and family. In fact, browsing through those catalogs, few aspects of my life seem to be exempt when it comes to having at least one app to support them!

TURN ON, TUNE IN, COP OUT?

I wrote in my previous column how much I enjoy reading paper magazines. I still receive a printed copy of *The Economist* each week and peruse the various computer-related magazines that arrive periodically in my mail (not only *Pervasive Magazine* and *IEEE Computer*, but also, e.g., *CACM* and *ACM Interactions*). Not surprisingly, I keep gravitating to “books & press” shops whenever I travel to see if any of their magazines on display catches my interest.

Having started exploring the wonderful world of health-related apps, I began to realize that this seems to be also a topic in the printed world—yet with a very different slant: recent magazine headlines read “DISCONNECT—How to avoid stress and regain new energy!” “SLOWING DOWN—Why this is hard!” and “DIGITAL DETOX—How to stay calm and find your inner focus.” Leafing through these articles, few seem to recommend installing *any* of this technology. In fact, they seem to suggest the opposite: turning OFF our phones and smart watches for prolonged periods of time throughout our day.

Maybe not surprisingly, but surely ironically, there are also many apps for this by now: the latest OS updates from both Google and Apple now feature so-called “Digital Wellbeing” features that offer (both directly to the user, as well via an API to other apps) summative statistics about one’s smartphone use. Moreover, one can define rules that limit access to certain apps after a certain total usage time is reached, or past a certain time of day. In his 1919 book *Disenchantment*, German economist Max Weber lamented the “belief that ... one can, in principle, master all things by calculation.” One hundred years on, this idea seems to be more present than ever!

TO APP OR NOT TO APP?

More often than not, I do find myself looking at my phone while waiting, e.g., at a bus stop, or even (occasionally!) when walking on a sidewalk. How much easier will this be with a screen on

my wrist? And what will happen once smart glasses, for e.g., North’s Focals, become widespread, where I can have a virtual image always in sight? Will having those apps and their notifications always in our sight make our lives easier and less stressful? Or will “always on” translate into “always stressed”? Will the plethora of health-related apps allow us to better manage striking a balance between online and offline, between productivity and play, between focus and relaxation? Will we need another app to find this balance?

IN THIS ISSUE

This special issue is all about “growing up digital”: not only has a generation of teens grown up in a world where the smartphone is a staple of life, they also are both user and object (e.g., child tracker) of such digital tools. Guest Editors Vassilis Kostakos, Bran Knowles, Panos Markopoulos, and Koji Yatani have collected five unique articles that investigate different aspects of how children and teens both use and are being monitored by pervasive technology.

We also have two feature articles in this issue. In “A Decade of Ubiquitous Computing Research in Mental Health,” Bardram and Matic analyzed over 40 historic systems and interview leading researchers in the area with respect to the most important technical and clinical challenges in this space. If you are interested in this area, you will find no better starting point for learning about the opportunities and challenges in this field!

The second feature article by Baron and Musolesi proposed a novel framework for “Interpretable Machine Learning for Privacy-Preserving Pervasive Systems.” The authors point out the privacy risk that lurk in the many digital traces that we leave everyday, yet end-users typically are unable to properly assess these risks: how should I know what, say, a digital merchant may learn about my interests by observing my browsing behavior on their shop? To tackle this information asymmetry, the authors proposed a novel framework that would allow individuals to better understand what a system can learn from their digital traces. Before sharing raw data with a service, users would first anonymously query a

privacy-preserving backend, which by pooling anonymous data from many users, can give a user a prediction on what a service may learn from their data. The user can then decide to share or not share their raw data, now with a better awareness of what these traces disclose about them. This is a fascinating approach that while being at a very early stage, already hints at the game-changing nature this may have for online privacy!

We also have three departments in this issue: Education and Training, IoT News, and Wearable Computing.

In our IoT News department, Alec Shuldiner provides a vision of *The Smart Village*—a place where smartness does not lead to surveillance, like in the “Smart City,” but to “neighborliness.” Shuldiner echoes an increasingly heard critical question about who really benefits from the sensing infrastructures that are increasingly being deployed in cities worldwide. His article questions the roles of privacy and transparency in future smart cities, and argues that only a “No secrets” approach ensures that cities remain livable. Food for thought!

Our Wearable Computing Department features a contribution by Lucy Dunne and Jamie Ward that tries to summarize the most recent Wearable Computing Symposium (ISWC), that was held in London in September 2019. Dunne and Ward identify five key themes: wearable haptics, social dynamics, e-textiles, wearable sensing, and activity recognition. If you have not been able to attend UbiComp/ISWC in the past year (or if you simply were unable to attend three sessions in parallel), you should find a wealth of interesting wearables-related articles to follow-up on in their conference report!

Finally, the Education and Training department features a report by Andrew Kun, Audrey Girouard, Anne Roudaut, and Orit Shaer on their 2019 Dagstuhl Seminar on “Ubiquitous Computing Education: Why, What, and How.” We already

featured this event in our July-September 2019 issue, when undergraduate student Amanda McLeod provided her view¹ on what an education in “Ubiquitous Computing” might be about. The article by Kun *et al.* provides a more complete summary of the issues discussed, and raises important challenges for ubicomp educators.

TEAM UPDATES

This issue sees long-term AEIC Steve Hodges retire, although he will continue to stay on the Editorial Board. Steve did no less than three terms as AEIC—I am very indebted to his timely and thoughtful handling of submissions! We also say good-bye to Sanjay Sarma, who also served three terms on the Editorial Board—thank you!

At the same time, I am excited to welcome Simon Mayer to the Editorial Board! Simon holds the Chair for Interaction- and Communication-Based Systems at the University of St. Gallen, Switzerland. His research focuses on the integration of physical things into the Web, and on making interactions of connected devices intelligible for people. Simon holds a Ph.D. degree from ETH Zürich, Switzerland. You can contact him at simon.mayer@unisg.ch.

REFERENCE

1. A. McLeod, “Ubiquitous computing education,” *IEEE Pervasive Comput.*, vol. 18, no. 3, pp. 59–62, Jul. 2019.

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