Department: From the Editor-in-Chief

The Paperless Magazine

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***Abstract*—As the Editor-in-Chief of a Computer Society Magazine, I still enjoy the privilege of receiving a copy of IEEE Pervasive in print format. Fewer and fewer of our readers still do the same. Will it soon be time to say Goodbye to print?**

In this day and age, most research articles are found through online searches in digital libraries (e.g., IEEE Xplore) or via online search engines (e.g., Google Scholar). It thus might not really matter all that much whether one publishes in a magazine or a journal/transaction—both types of publications are indexed the same way. However, magazines always have been very different "beasts": while we publish regular peer-reviewed articles, we also have a lot of nonpeer-reviewed content: our departments. Departments allow our Editorial Board to shape the contents of our publication in a very different way than peer-reviewed content does. While we have always used special issues to focus our content on what our board members believe to be key trends in our field, the recurring nature of departments allows their editors to explore an area (e.g., Pervasive Education, the Smart Home, or Wearables) from a multitude of perspectives and—thanks to each editor's extensive professional network—with the input of key researchers in the field. The second key difference between magazines and transactions, apart from their different content composition, are their subscription numbers. In general, magazines always had many more subscriptions than transactions did. Magazine subscriptions moreover came predominantly from individuals, while transactions would typically be subscribed by libraries. Both the different content and the type of subscription (personal versus institutional) ultimately would result in very different reading behavior: while few transactions would ever be read front-to-back, sequential access was usually the default for a magazine like *Pervasive*: starting with the EIC message, one would find a couple of departments, the Guest Editors' introduction and their corresponding theme articles, several "feature" (i.e., non-theme) articles, and finally a few more departments. Obviously, few readers would read an entire issue, but, most importantly, many would end up reading articles that they did not specifically seek out, nor would have found otherwise. This "serendipity" has not translated well into the digital library (DL) type of access:

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you search, you browse, you download. DL users will never be aware of the articles that appeared alongside the PDF they just downloaded!

TRACKING THE COFFEE TABLE

A second implication of the move from paper subscriptions to digital libraries concerns measuring the success of a magazine. For many years, the number of subscriptions was one of the key performance indicators of a publication. While individual article impact could be tracked with the help of citation databases, the financial success of a publication ultimately depended on how many copies it could sell. Clearly, subscription numbers always were approximations of readership at best. During my time as a Ph.D. student, I still remember the stack of magazines that were available to us in our group's common room, allowing all group members to "share" one subscription. Today's digital libraries make tracking the actual reader behavior not only much easier, but also much more fine-grained: not only will each Ph.D. student now download their own version, they will most likely also only download the articles they are actually interested in reading. Not surprisingly, publishers like IEEE and ACM are keen on making sure that all such downloads go through their respective libraries, instead of, say, downloading a PDF directly from the author's personal homepage (ACM's "authorizer" links are one neat way of allowing authors to virtually host a copy of their work on their homepage, while still allowing ACM to track each download).

As much as this unbundling of publications in today's digital libraries aids tracking individual article interest, it clearly counteracts the fundamental nature of a magazine, i.e., the idea of almost accidentally discovering interesting content.

DIGITAL, PAPER, OR DIGITAL PAPER?

Even though most of our readers access our magazine through an IEEE Xplore subscription, you *can* still subscribe to *Pervasive* individually: an annual subscription (4 issues) costs USD $39 digitally (USD $20 for students) or USD $74 for a printed copy (USD $37 for students). If you order a digital copy, you can download both a PDF and an ePub of the entire issue. In principle, the faithfully represented PDF *should* allow readers to explore an issue just as the printed version had before, yet anyone who has tried to read a magazine or a newspaper on an electronic device will agree that it is still a vastly different experience from the paper version: yes, searching through an entire issue is a big bonus. But browsing by swiping left and right is still cumbersome compared to the ease with which one leafs through a printed magazine. And even though it is digital, publishers again do not know how subscribers are reading through each issue (though this would technically be possible when moving to specialized e-magazine apps).

Today's e-reading devices are also still forcing people to choose between colorful and reasonably quick navigation (tablet) yet heavy and quick-to-run out of battery, or black and white and slow (e-book reader) but light and long battery life. E-readers have the vastly better ecological footprint, potentially surpassing a (daily) printed newspaper already after a bit over a year. The much more resource-intensive tablet is still far from being "better" than paper in this respect. I do own a Surface Pro that I love dearly, yet reading a digital copy of *Pervasive* on it is really not a very pleasant experience: while the 12" screen is a good size, the tablet is simply too heavy for casual reading. It is also hard to read in sunlight, which is something that works much better on my Kindle (which is also light and has great battery life)—yet reading a magazine in black and white really takes away a lot of the experience. The PDF format also does not work well for the Kindle, yet the ePub alternative makes it cumbersome to explore figures and graphs. A true Goldilocks problem!

FUTURE PUBLISHING

This year manufacturers like Samsung, Motorola, Huawei, and Microsoft announced (some even also released) mobile phones featuring a foldable screen. While a mobile phone factor, even when using a foldable screen, will most likely be too small to read a magazine, the

same technology in the tablet space (e.g., the Surface Neo) might more faithfully recreate the page-spread view of a traditional print publication. Still, all of these devices use backlit screens, so they share the same problem as today's tablets: poor battery life, poor visibility in sunlight, and heavy weight. While color e-paper has been in the works for quite some time now, it might still be several years before color e-readers will become widely available. However, once we can integrate a foldable form factor with color e-paper, a worthwhile experience might emerge.

It will be interesting to see if such technological advances will be able to significantly improve the act of reading a digital magazine. For now, my printed copy of *Pervasive* still gets a lot of attention (as do my copies of *Computer* and *IEEE Spectrum!*), while its digital sibling serves mostly as an archival record. I do hope the Computer Society decides to keep printing *Pervasive* at least for a few more years—it will certainly be a much poorer experience if I would have to switch to the fully digital experience of our magazine anytime soon!

IN THIS ISSUE

The theme for this issue is all about building the "perfect" device: given recent advances in digital system design and manufacturing, we can now not only personalize the *software* of a device, but also create personalized *hardware* by virtue of three-dimensional printing and a correspondingly advanced tool chain for device design. Oliver Amft, Jennifer Mankoff, and Mary Baker serve as this issue's Guest Editors—they present exciting new work that highlights the great potential in this space for creating truly personalized experiences. The Guest Editors have also done a series of interviews with both researchers and artisans active in digital fabrication—a fascinating read that really captures the wide variety of areas (from electronic devices to music to food) that will be affected by these developments!

We also have several departments in this issue. Apart from the set of interviews with Makers by Amft and Baker, we also have a Theme Spotlight article by Hodges and Chen—read more about them in the Guest Editors' Introduction. In addition, this issue features three of our regular departments: IoT News, Pervasive Health, and Conferences.

In our IoT News department, Youssef and Hassan report on their vision for the next generation IoT devices that are not only cost-efficient, but also highly autonomous. Only if we can reduce device maintenance to the absolute minimum will today's vision of a world filled with smart devices become a reality. The authors begin by addressing the energy autonomy of an IoT device, using both novel sensing technology as well as energy harvesting approaches.

Our Pervasive Health department features a contribution by Foad Hamidi on how DIY Assistive Technology enables new forms of stakeholder engagement around the world. The author reports on projects in both the US and Kenya, highlighting how local infrastructure support is critical to the success of such initiatives, which is particularly challenging in developing countries.

Finally, the Conferences department features a report on this year's UbiComp/ISWC conference in London. The authors highlight interesting novel work in no less than eight key areas (e.g., health and privacy). With more than 200 paper presentations at UbiComp/ISWC 2019, any summary will surely be bound to miss important work, but the authors provide a great overview on key trends.

TEAM UPDATES

In this issue, we say good-bye to long-term Editorial Board member Jason Hong. Jason has been with the magazine for no less than five terms! Also ending her tenure on the board is Cecilia Mascolo, who unfortunately is not able to renew for a second term due to several new roles she took on at her University. I thank both Jason and Cecilia for their many contributions to the magazine and hope that we will be able to draw on their continued support when it comes to promoting our publication. Thank you!

If you are holding a printed copy in your hand, it is now time to turn a page and begin your discovery! If you downloaded this from a DL, check out ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=7756 to see all that you are missing 😊!

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