Column: From the Editor-in-Chief

A Plan B for Plan S?

In September 2018, a large group of European funding agencies called "cOAlition S" published "Plan S"—a 10-point program to make all their funded research publicly available under a strict Open Access (OA) publication model by 2020. cOAlition S founders include heavyweights such as the European Research Council ERC, France's ANR, and U.K. Research and Innovation. Many other European funding agencies (e.g., Germany's DFG and Switzerland's SNF) have pledged support for—but not yet signed—Plan S. DFG and SNF, however, are signatories to the much older OA2020 initiative, which has similar goals as Plan S though is less prescriptive in how to reach them. While dominated by European universities and their libraries, OA2020 also features about a dozen U.S. institutions, including the University of California system.

OPEN ACCESS MODELS

Both OA2020 and Plan S signatories want to abolish subscription-based publishing models. In the Open Access publishing model, it is not the reader who pays for access to research articles (or, usually, their university or company through a subscription) but the author. The following three principal approaches exist today.

1) Green Open Access sees articles published in a regular (i.e., non-Open Access) publication. However, after a so-called "Embargo Period," the author puts the article into an Open Access repository, typically an institutional repository. This is also often called "self-archiving," as the authors are responsible for registering their articles with the repository.
2) Gold Open Access, also often called "Full Open Access," sees all articles in a publication made immediately available directly by the publisher, without restrictions. As the publisher receives no subscription fees for such publications, costs are instead covered by the so-called "article processing charges" (APCs) paid by the authors. Most APCs are between $2000 and $3000, although some expensive journals may charge $5000 and more.
3) Hybrid Open Access is similar to Gold Open Access, but authors publish their OA articles in a traditional subscription-based publication. By paying an APC, their article is made available without restrictions, while other content in the same publication remains behind the publication's paywall.

Maybe not surprisingly, Hybrid Open Access has so far been the model most favored by publishers, as it allowed them to continue their traditional subscription-based revenue model while also accommodating authors who wanted to (or had to) publish their article without a paywall. However, the ambitious Plan S has explicitly banned this model: Starting January 2020, signatory funding agencies will not pay for *any* Green or Hybrid OA publications (with some exceptions for "transformative agreements," as follows). This effectively cuts off traditional publications (such as IEEE Pervasive) from research funded by any of cOAlition S's funding agencies.

TRANSITIONING TO OA

Both OA2020 and cOAlistion S have already had a huge impact on the publishing industry. Many publishers (e.g., Wiley, Cambridge

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University Press) have signed the so-called "publish and read" deals, where institutions, instead of paying for a subscription, pay a lump sum to a publisher to make all of the institution's publications open access, while also gaining access to the publisher's digital library. While maybe not different in overall amounts from previous subscriptions, publish-and-read deals nominally dedicate the majority of the lump sum amount toward APCs, while a diminishing part covers read-access to non-OA publications. This effectively avoids the double-payment inherent in Hybrid Open Access publishing, where authors pay APCs while their institutions still must pay for a full subscription. Under Plan S, publish-and-read deals are explicitly allowed as "transformative agreements," given that their terms are public and there is a clear strategy to eventually arrive at a full Gold Open Access model. Even one of the strongest defender of the traditional publishing model, Elsevier, finally struck a publish-and-read deal with a consortium of Norwegian universities in April 2019, after several high-profile institutions (University of California, as well as a consortium of Universities in Germany, Hungary, and Sweden) had canceled their traditional multimillion dollar subscriptions with the publisher.

Publish-and-read deals buy publishers time as they transition into an Open Access world. However, Plan S and OA2020 eventually call for "pure" (i.e., Gold) Open Access, with no payments going toward subscriptions. Publishers, thus, have two options: start a new "Gold Open Access" publication, or "flip" an existing publication from subscription-based to Gold Open Access. Both approaches come with significant challenges. Flipping an existing publication allows one to benefit from its reputation (e.g., Impact Factor) yet risks a significant drop in submissions, as many authors may not have a funding agency ready to pay the pricey APCs. On the other hand, starting a new publication allows one to keep the old "free to publish" option around, yet might initially suffer from the lack of reputation, and thus submissions. Also, Plan S explicitly forbids the so-called "mirror" OA publications that have a largely overlapping scope and shared editorial board with an existing subscription-based journal (this obviously being simply another form of Hybrid Open Access).

CHALLENGES FOR MAGAZINES

IEEE has already started several Gold Open Access journals—most notably its flagship "IEEE Access," a multidisciplinary journal that has since established a strong scientific reputation (IF: 3.557). Over the course of the next years, IEEE societies and councils will need to evaluate how to move their existing subscription-based publications toward Open Access.

To begin with, any APC pricing model will need to consider that not every author will have a funding agency behind them that can pay these charges, thus calling for a diverse set of fees with significant discounts and waivers for authors from middle-income and low-income countries. One also must not forget that in a "pay to publish" model, corporate spending will largely go away (which accounts for up to 25% of income in today's subscription models), further exacerbating the APC charges necessary to recover all costs. Fine-tuning these charges is going to be a difficult and lengthy process, and publishers will need to make sure that they are not damaging a publication by choosing too costly rates.

Magazines will be particularly difficult to transition, as they have much more diverse content than a typical journal: apart from peer-reviewed theme articles and feature articles, magazines feature a substantial amount of non-peer-reviewed content (called "departments" in IEEE Pervasive). Clearly, having volunteer editors pay for their service of writing or editing a department is out of the question. This, in turn, means that the authors of peer-reviewed magazine articles will also have to cover the costs for publishing the non-peer-reviewed content through their APCs. With up to half of a magazine issue being contributed content, magazine APC, thus, run the risk of being twice as high as APCs for regular transactions (if not higher, as the additional editing of magazine articles makes them already more costly to begin with). Will magazines be able to remain a viable publication venue, given that they will most likely cost more to publish in? While publishers could set uniform rates across their entire publication portfolio, thus helping offset higher magazine costs by additional revenue from transactions, competing journal-only publishers could easily undercut those rates and thus create a strong incentive to publish with them instead. No one

yet knows what influence, if any, APC rates have on an author's decision to publish in a certain publication.

PERVASIVE OPEN ACCESS?

IEEE Pervasive currently supports only Green OA: authors can publish preprints on arXiv.org, as well as their author-submitted accepted article on their personal or institutional website. If a funding agency requires Open Access, authors can furthermore deposit the article with the funder's repository after an embargo period of 24 months (or less, if required by funder). You can find the full policy (which applies to all IEEE subscription-based publications) at https://journals.ieeeauthorcenter.ieee.org/become-an-ieee-journal-author/guidelines-and-policies/policy-posting-your-journal-article/.

It thus remains to be seen how Plan S will impact our submission numbers come January 2020. It might in fact take much longer for any effect of Plan S to arrive: In most participating countries, the new rules of Plan S only apply to research grants starting *from* January 2020, not to already funded research. Also, it is unclear how strict the actual enforcement Plan S will be handled by each agency. Will my funds be cut when someone discovers that I published an article in a non-OA publication? Is there a certain OA-to-non-OA publication ratio that will still be tolerated? Last but not the least: even though Plan S has been adopted by over a dozen (mostly European) funding agencies, it is unclear how much of their research usually makes its way to IEEE Pervasive. It is, thus, highly likely that—at first—not much will change for our magazine, even after Plan S goes into force.

However, efforts such as Plan S and the OA2020 initiative are here to stay, and these *will* change today's publishing model significantly—maybe not next year, maybe not in 2021, but eventually we will need to find a new way to sustain a publication such as IEEE Pervasive. We need to start working on our Plan B!

IN THIS ISSUE

This issue looks at the recent emergence of speech as the primary interface to computing systems. Guest Editors James A. Landay, Nuria Oliver, and Junehwa Song have selected four articles that provide a closer look both at today's state of the art and at future challenges. You can find their Guest Editors' Introduction in the following.

This issue also contains three feature articles. In "A system for privacy-preserving access accountability in critical environments," Francesco Buccafurri, Gianluca Lax, Serena Nicolazzo, and Antonino Nocera propose a new take on using *k*-anonymity to provide privacy-aware presence accountability. In order to avoid the need for a central trusted entity, their system is using a decentralized hash computation that can still ensure a degree of uncertainty. In "New challenges in display-saturated environments," Mateusz Mikusz, Kenny Tsu Wei Choo, Rajesh Balan, Nigel Davies, and Youngki Lee analyze a huge public displays deployment in Singapore's Suntec Convention and Exhibition Center, which features over 800 displays. Using this huge installation as an approximation of "things to come," they identify the need for novel content creation tools, interaction methods, content scheduling, privacy and personalization, and display analytics as key. Finally, "Challenges in realizing smartphone-based health sensing" by Alex Mariakakis, Edward Wang, Mayank Goel, and Shwetak Patel explores the future of DIY health sensing using consumer smartphones. Based on the authors' extensive experience with deploying health-sensing apps, they identify key challenges in this space and describe the pragmatic solutions they adopted in order to make use of these tools as easy as possible. Given the widespread adoption of smartphones, the ability to deploy advanced health apps on such consumer devices surely makes it a worthwhile endeavor to work around their limitations!

You can also find four of our regular departments in this issue. In his Education & Training Department, Editor Andrew Kun presents "Fourteen books that can inspire teaching in pervasive computing (and beyond)." Our "Smart Home" Department has Editors AJ Brush, Mike Hazas, and Jeannie Albrecht join David Irwin to present some recent research presented at two major conferences in the field: eEnergy 2018 and BuildSys 2018. A similar conference overview, this time from the most recent "International

Symposium on Wearable Computing" (ISWC 2018) can be found in our Wearable Computing department: "Towards smarter wearable technologies that blend with our bodies." Department Editors Kristof Van Laerhoven and Oliver Amft have asked Symposium Chairs Roshan Peiris, Thad Starner, Michael Beigl, and Kai Kunze to provide a short summary of the presented work. In our fourth department, "Pervasive Healthcare," Editor Jesus Favela has invited Kristina Yordanova to describe open challenges in gathering quality health-related annotated data.

TEAM UPDATES

I am very happy to welcome three new Editorial Board members in this issue: Gerd Kortuem, Gabriela Marcu, and Nadya Peek.

Gerd Kortuem is a Professor and a Chair of Internet of Things in the Industrial Design Engineering Faculty at TU Delft, a Principle Investigator with the Amsterdam Institute for Advanced Metropolitan Solutions, and a Member of the Delft AITech initiative on Meaningful Human Control of Autonomous Intelligent Technology. He received the Ph.D. degree from the University of Oregon, USA. Contact him at g.w.kortuem@tudelft.nl.

Gerd will take over the IoT Department from Fahim Kawsar, who moved into an AEIC role last year.

Gabriela Marcu is an Assistant Professor with the University of Michigan School of Information. She studies the role of mobile and information systems in coordination of care, collaboration of care teams, and access to care for underserved populations. She received the Ph.D. degree in human–computer interaction from Carnegie Mellon University. Contact her at gmarcu@umich.edu.

Gabriela will take over the Pervasive Health Department from Jesus Favela, who, after more than four years of service, decided to step down from his department editing (he will stay on the EdBoard, however). As a former Co-Editor, Gabriela will feel right at home in her new role. Thank you both for your service!

Nadya Peek directs the Machine Agency at the University of Washington, where she is an Assistant Professor in human-centered design and engineering. Spanning electronics, firmware, software, and mechanics, her research focuses on harnessing the precision of machines for the creativity of individuals. She received the Ph.D. degree from MIT Center for Bits and Atoms. Contact her at nadya@uw.edu.

Nadya takes over the "Maker Tech" Department from Stephanie Mueller, who unfortunately had to step down ahead of her regular term in order to better focus on her university role. Thanks, Stefanie, for helping shape this new column and to Nadya for being up for the challenge of making it a true staple of IEEE Pervasive Computing!

ABOUT THE EDITOR-IN-CHIEF

Marc Langheinrich is a Professor in the Faculty of Informatics at Università della Svizzera Italiana, Lugano, Switzerland, where he heads the Research Group for Ubiquitous Computing. His main research interests include usable privacy, pervasive displays, and ubiquitous computing. He received the Ph.D. degree in computer science from ETH Zürich. Contact him at langheinrich@ieee.org.