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3D-PRINTING HANDS THAT FEEL

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MOBILE COMPUTING & COMMUNICATIONS REVIEW

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MESSAGE FROM THE EDITOR-IN-CHIEF

Landon Cox

This month's cover story is about a prosthetic-device company called Psyonic that was started by researchers from the University of Illinois at Urbana-Champaign in 2016. Reading about the underlying technologies was fun, but the one aspect of the article that stood out for me is the importance of affordability. The peer-review process (rightly) prioritizes intellectual novelty and, as a result, optimize their output for novelty. Sometimes intellectual novelty manifests itself as cost-efficiency (e.g., demonstrating near-equivalent functionality from much lower-cost components), but this is rarely a first-order objective. Delivering a product to the marketplace demands different priorities because unaffordable technologies cannot have impact, no matter how intellectually clever they are. However, just as research incentivized by peer-review to be novel can sometimes result in lower costs, products incentivized by the marketplace to sell can sometimes be novel as well. Psyonic's Ability Hand appears to be a happy convergence of both phenomena.

Another great example of someone who delivered novelty to the marketplace can be found in our honoring of 2020 ACM SIGMOBILE Contribution Award winner, Martin Cooper. Cooper, of course, invented the first cellular phone, the DynaTAC, in 1973. I love the way that Cooper describes his approach to technology as focusing on people rather than products to maximize impact. This is a great way to summarize how technology must make people's lives better but it must also be within reach.

On the opposite end of the spectrum, Vamsi Talla, Joshua Smith, and Shyamnath Gollakota wrote an article on open problems in backscatter communication. Because of the work from people like the co-authors, backscatter has been the subject of many tantalizing research results over the past decade. And yet the article shows how it can take a technology several decades before it is ready to improve

people's lives. Among the authors' ten open challenges, two stood out to me. First, since Apple has embraced ultra-wideband radios in its devices, researchers should start developing ultra-wideband backscatter systems so that it can be better integrated with the technology of today. And looking further out, backscatter should easier to integrate with everyday materials like plastics. Backscatter is fundamentally a mechanical mechanism and the hope is that research can identify materials with backscatter-supporting mechanical properties. These two challenges represent different but equally important research horizons; in the near-term, backscatter can try to draft in the wake of a specific market force (Apple devices) and, in the long-term, backscatter can dream of being embedded in everyday objects.

The primary reason that this issue's articles have resonated with me in this way is because I recently moved from a research-oriented organization (Microsoft Research) to a product-oriented organization (Azure for Operators). The line between each organization's role in research and product is not so clear cut: Microsoft Research is involved in product development and Azure for Operators will produce research. Nonetheless, being in Azure for Operators has given me renewed appreciation of the challenges of delivering novel research to the marketplace. SIGMOBILE has highlighted research that provides practical solutions to real problems. Beyond the articles described above, each article in this month's issue reinforces this standard: *CCAST* allows heterogenous drone swarms to communicate, *Osprey* shows how mm-Wave sensing can monitor tire wear, *mm-FLEX* enables experimental research on mm-Wave wireless communication, and *SonicPrint* uses microphones to identify a figurative fingerprint from the audio of a swipe of a literal fingerprint.

It is encouraging that we continue to see the kindred spirits of innovation and impact in our community's work.

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