Editorial: Reimagining ACM Transactions on Embedded Computing Systems (TECS)

Welcome to the latest issue of the *ACM Transactions on Embedded Computing Systems (TECS)*.

TECS is the flagship journal in embedded systems spanning the entire spectrum from software to hardware, from applications to design methodologies. The journal has evolved in tandem with the rapid transformation of the field and serves as the nexus of research and innovation. I am honored to have the opportunity to continue the tradition.

I started my journey as the Editor-in-Chief of TECS in 2020 in the middle of a global pandemic. As we begin 2021 with cautious optimism about returning to some semblance of a normal life, it is also time to reimagine the vision and the future of the journal.

On the one hand, it is the perfect time to be involved in the embedded systems research. Now more than ever, embedded system is firmly driving the technological revolution that blurs the line between physical, biological, and cyber entities. Embedded systems provide the foundation of almost all modern electronics systems today from automotive, avionics, smart grids to medical devices, wearables, and myriad consumer electronic devices. The challenge of designing complex, low-power, high-performance, safety-critical, secure, real-time, intelligent embedded computing systems that serve as the fundamental building blocks of these devices has grown exponentially. From a broader perspective, computing systems research, in general, is increasingly adopting a holistic, integrated, cross-layer, hardware-software codesigned approach that has been the cornerstone of embedded systems research from the onset. As a result, TECS is uniquely positioned to steer the course of these exciting developments.

On the other hand, we are living in an unprecedented time where the well-established conference model needs rethinking and the distinctions between journals and conferences are getting fuzzy with the virtual events. We, the embedded systems community, are facing a predicament in both research and education with limited access to lab facilities in most parts of the world. But we are resilient, and I am confident that the journal will emerge stronger by embracing the emerging research opportunities and addressing the challenges imposed on us by the pandemic.

I envision the journal to flourish at the forefront of research by continuing to engage with the core embedded systems community and aim to revitalize it by building bridges to the cognate research communities that contribute to the different theoretical and systems aspect of the embedded systems design including formal methods, real-time systems, machine learning, computer security, operating systems, sensor networks, compilers, computer architectures, design automation, and hardware-software codesign. Needless to say, TECS is evidently intertwined with the Internet of Things and Cyber-Physical Systems in the form of intersecting but synergistic, complementary focus.

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We welcome leading-edge research that help advance embedded computing systems by addressing the key challenges. The scope of TECS includes, but is not limited to, the following topics:

- Embedded software design and analysis
- Architectures, accelerators, and system synthesis
- Hardware-software codesign
- System-level modeling and analysis
- Verification and validation
- Real-time systems
- Security, privacy, reliability
- Low-power design and sustainability
- Embedded machine learning
- Autonomous embedded systems
- Industrial practices and case studies
- Embedded systems education

In my endeavor to strengthen the journal, I am fortunate to have the support of a distinguished [editorial board](#) comprising 16 continuing and 24 new associate editors. The expertise of the editorial board adequately covers the comprehensive spectrum of embedded systems topics, both the classical and the emerging ones. The board is also diverse with equal representations from Asia, America, and Europe as well as a substantial representation of women (24%).

We have focused on improving the review turnaround time. We are committed to offer fast turnaround time from submission to initial decision (2 months) as well as subsequent revisions. In a fast-paced field like ours, it is essential to have a nimble reviewing process enabling the authors to disseminate their peer-reviewed research in a timely manner and creating a virtuous cycle of exciting scientific advances and innovations. I am happy to share that the time from the **original submission to the first decision has been drastically reduced to an average of 60 days** with close to 95% decisions being communicated within 90 days. This milestone has been achieved due to the tremendous effort of the entire editorial board and the reviewers. We will further introduce a review board comprising promising junior researchers to acknowledge the contributions of the frequent authors and peer reviewers.

We would also like to capitalize on the unique strengths of the journal as a publication venue as opposed to the conferences, which exclusively focus on original research articles. Traditionally TECS has served as the publication outlet for new research articles and extended archival versions of the conference papers. **TECS will no longer have any page limit** for the articles, allowing the authors to provide comprehensive and rigorous treatment of the research without space or time constraints associated with the conferences. Note that there are no page charges for the TECS papers and ACM offers a number of pathways toward **open access publication**.

In parallel, we have launched a number of [new initiatives](#) to complement regular research papers and attract broader readership beyond the core embedded systems community. These include **Perspective Articles** written by the leaders of the field, **Survey Articles** that synthesize and organize recent research results in a novel way to add understanding to work in the field, **Tutorial Articles** that introduce the basic concepts of a field to the readers outside the speciality in an accessible way, and shorter length **Industry design papers** written by practitioners to share their software, systems, or hardware design experiences with the broader audience. Finally, we are proactively soliciting **Special Issue** proposals on important, timely and stimulating themes from the active members of the extended research community working on these themes. We currently have two open special issues on *Accelerating AI on the Edge* and *Memory and Storage Systems for*

Embedded and IoT Applications, and several others in the pipeline. We encourage submissions in all these new categories.

TECS has thrived due to the enthusiastic, high-quality contributions from the authors, editors, reviewers, and the support of the readers to shape the predominant research directions of embedded systems. Let us build on that solid foundation and collectively take the journal as well as embedded computing systems research to greater heights.

Please contact me by email if you have any questions or comments. I very much look forward to interacting and engaging with all of you.

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Editor-in-Chief
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