

## Introduction to the HICSS-56 Software Development for Mobile Devices, the Internet-of-Things, and Cyber-Physical Systems Minitrack

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Applications for mobile devices (apps) have facilitated the success of smartphones and tablets. By using apps, the multi-purpose hardware of modern devices can be utilized to the full extent. Despite much progress in development methods, software development kits, and frameworks, app development poses many challenges. This is even more so for novel mobile devices such as wearables and for the hardware that constitutes the Internet-of-Things (IoT) and Cyber-Physical Systems (CPS). Compatibility, performance, battery-saving, and security and safety are only some of the issues that are mainly driven by the quality of the used software. A satisfying level of this quality in many cases is very hard to achieve and proper techniques for testing and formal verification are needed.

Experiences and methods from classical software development can only be utilized to some degree. Moreover, the inherent challenges of the respective new devices ask for novel solutions. The challenges sketched above are reinforced by the conditions that development activities meet. Typical particularities include the need for multi-platform development, device fragmentation, context-sensitivity, low computational power, little memory, energy conservation requirements, and the heterogeneity of users. With the emergence of multi-platform and multi-device, the new golden standard are applications not only across software ecosystems, but across hardware platforms such as laptop, mobile, tablets, embedded devices, sensors, and wearables. Therefore, new threads of research are needed to tackle these issues and to pave the way for improved software development, better business producibility and improved user experience (UX).

This minitrack started as *Mobile App Development* (HICSS-49 (Majchrzak & Heitkötter, 2016) and HICSS-50 (Majchrzak & Grønli, 2017)) before broadening to *Software Development for Mobile Devices, Wearables, and the Internet-of-Things* (HICSS-51 (Majchrzak & Grønli, 2018) and HICSS-52 (Majchrzak & Grønli, 2019)). Since

its fifth year (HICSS-53 (Majchrzak et al., 2020), HICSS-54 (Majchrzak et al., 2021), and HICSS-55 (Majchrzak et al., 2022)), we adapted it to the further changing landscape to keep it attractive to the community, now including cyber-physical systems (CPS).

The minitrack covers six papers:

1. *Source Code Protection against Unauthorised Copying and Analysis in IoT Devices* by Tomasz Hyla and Sebastian Byczyk
2. *Codeless App Development: Evaluating A Cloud-Native Domain-Specific Functions Approach* by Chuhao Wu, José Miguel Pérez-Álvarez, Adrian Mos, and John Carroll
3. *Effect of App Market Conditions on Permissions Usage by App Developers* by Jia Wei and Kamesh Mallampalli
4. *Machine Learning-Based Power Consumption Prediction for Unmanned Aerial Vehicles in Dynamic Environments* by Julian Gatscher, Johannes Breitenbach, and Ricardo Buettner
5. *Kernel-Segregated Transpose Convolution Operation* by Vijay Srinivas Tida, Sai Venkatesh Chilukoti, Sonya HY Hsu, and Xiali Hei
6. *Criteria Based Evaluation of Cross-Platform Development Frameworks* by Ali El Tom, Cristian Bogdan, Tim A. Majchrzak, and Tor-Morten Grønli

We are glad that we again had many helping hands. We are proud that all authors that submitted papers to our track got on average 3½ constructive reviews as well as an additional meta-review. We think that we outperform many journals with this effort in giving authors advice, whether their papers are accepted or not. And continuing this to the eighth edition of the minitrack is satisfying. Therefore, we would like to thank (and

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