Preface

The 29th International Conference on Architecture of Computing Systems (ARCS 2016) was hosted by the Department of Computer Science at Friedrich-Alexander University Erlangen-Nürnberg (FAU), Germany, during April 4–7, 2016. ARCS took place in Nuremberg, a beautiful city where medieval vistas meet modernism and technology. The conference continued the long-standing ARCS tradition of reporting top-notch results in computer architecture and other related areas. ARCS was founded in 1970 by the German computer pioneer Prof. Wolfgang Händler, who also founded the Computer Science Department at FAU in 1966. It was a privilege to have brought ARCS back to its roots in honor of the CS Department's 50th anniversary. The conference was organized by the Special Interest Group on Architecture of Computing Systems of the GI (Gesellschaft für Informatik e. V.) and ITG (Informationstechnische Gesellschaft im VDE), which held the financial responsibility for this ARCS edition. The conference was also supported by IFIP (International Federation of Information Processing).

"Heterogeneity in Architectures and Systems – From Embedded to HPC" was the specific focus of ARCS 2016. This leitmotif reflected the ongoing progress in semiconductor technology that allows for building fascinating, complex computing systems, including multiple (heterogeneous) microprocessors, large on-chip memory hierarchies, advanced interconnection networks, and peripherals. The downside to this technological progress is that computing has already hit a power and complexity wall. Thus, energy efficiency has become the key driver behind performance scaling across all areas, from portable devices, such as smartphones and tablet PCs, to high-performance computing (HPC) systems. This is why computing systems have begun to include more and more heterogeneous hardware with various, specialized resources, such as accelerators (e.g., GPUs or FPGAs) dedicated to one application domain. However, designing and testing as well as the parallel programming of such heterogeneous computing systems are challenging tasks. Aside from energy efficiency, predictability, fault tolerance, accuracy, and security are often at least equally important aspects when designing hardware and software. Thus, novel concepts as well as long-reaching research in the areas of computer architecture design, computation models, parallelization methods, software stacks, and programming and debugging tools are required.

The ARCS 2016 program included an exciting collection of contributions resulting from a successful call for papers. In response to the call for papers, 87 submissions were received with affiliations to 31 countries. Each submission was subjected to rigorous review from four Program Committee members. After having intensely scrutinized the reviews, we were pleased to present a high-quality technical program that included a total of 29 papers at the conference. The selected papers were divided into thematic areas (nine sessions), which highlighted the, at the time, current focus of research endeavors within computing systems. The sessions covered topics on

architecture design (accelerators, NoCs, caches, security components), approximate and energy-efficient computing, organic computing systems, parallelization and mapping approaches, including various aspects on timing, performance modeling, and reliability. The strong technical program was complemented by three keynote talks on: "Knights Landing Intel Xeon Phi CPU: Path to Parallelism with General Purpose Programming" by Avinash Sodani, Intel, USA; "Massive Parallelism – C++ and OpenMP Parallel Programming Models of Today and Tomorrow" by Michael Wong, IBM, Canada; and "Heterogeneous Systems Era" by John Glossner, Optimum Semiconductor Technologies, USA. The five workshops focusing on specific sub-topics within ARCS were organized in conjunction with the main conference, one on parallel systems and algorithms, one on dependability and fault tolerance, one on self-optimization in autonomic and organic computing systems, one on multi-objective many-core design, and one on improvements to safe, multi-core, and software-intensive systems.

We would like to thank the many individuals who contributed to the success of the conference, in particular the authors who responded to our call for papers, the members of the Program Committee and the additional external reviewers who, with their opinion and expertise, ensured a program of the highest quality. The workshops and tutorials were coordinated by Ana Lucia Varbanescu, while Thilo Pionteck assisted in organizing the proceedings. Many thanks to the team at FAU, which substantially helped in the local arrangements. In particular, Ina Derr's and Ina Hümmer's organizational talent was greatly appreciated and Dominik Schönwetter ensured that the Web interactivity remained engaging and responsive. Thank you all.

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