EDITORIAL

Brian Dorn & Jan Vahrenhold

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This editorial not only presents the three articles published in this issue but also serves to introduce recent changes in the journal’s leadership and editorial board as well as in the call for papers.

After many years of leading this publication, Sally Fincher and Laurie Murphy have stepped down from their editorial duties. We sincerely thank them for their long-time dedication to Computer Science Education, their vision for its future development, and the guidance offered throughout the transition period over the past year. As incoming editors we have been truly humbled to attempt filling your shoes, and we can only hope to contribute to the longevity of Computer Science Education as you have modeled.

We also thank the outgoing members of the editorial board: Carl Alphonce, Mordechai Ben-Ari, Andrew Bernat, Dennis Bouvier, Michael Caspersen, Michael Clancy, Nell Dale, Gerald Engel, John Fulcher, Brian Hanks, W. Michael McCracken, Helen Sharp, and Steve Wolfman. They have shaped the journal, at times over many years, and deserve our sincerest gratitude. We are pleased that Yifat Ben-David Kolikant and Tony Clear will continue to share their expertise on our new editorial board.

Since the inception of this publication some 20-plus years ago, research in our field has expanded well beyond its initial focus of undergraduate computing education. In particular, much research is being done outside tertiary education, most notably in primary and secondary school contexts – including teacher training – and in informal learning environments. Also, we have witnessed growing links to research in allied disciplines like learning sciences and educational psychology, and this has been accompanied by an adaptation of a broad and growing set of research methodologies in our field. In this issue, you will find our new general Call for Papers which reflects this growing diversity.

With this increasing breadth in mind, we are excited to welcome our new incoming editorial board members: Leigh Ann DeLyser, Andreas Mühling, Kylie Peppler, Anthony Robins, Juha Sorva, David Weintrop, and Aman Yadav. Combined, our editorial board represents the broad variety of research orientations, methodologies, and geographic contexts Computer Science Education aims to attract. Further, we are pleased that all nine of our editorial board members have accepted additional associate editor responsibilities for the journal. Not only will they help us guide the future direction of this publication, but they will also play a vital role in the identification of high quality contributions across the spectrum of our discipline.
Yifat Ben-David Kolikant is a Professor in the School of Education at the Hebrew University of Jerusalem. Her academic work is devoted to theorizing learning, teaching, and schooling in the age of globalization and digitalism, an age characterized by the ubiquity of digital technology, an information explosion, pluralism, and rapid changes. Over the past few years, she has dealt with three core questions: (a) How does students’ informal experience with computers and the Internet influence schooling, (b) how can effective teaching environments be characterized, and (c) how can we best support and enhance in-service teacher learning and performance under conditions of rapid changes, such as dramatic curricular and policy changes?

Tony Clear is an Associate Professor within the School of Engineering, Computer & Mathematical Sciences at Auckland University of Technology. His research interests are in Computer Science Education, Global Software Engineering, Collaborative Computing, and Global Virtual Teams. He holds positions as an Associate Editor for Computer Science Education, ACM Transactions on Computing Education (TOCE), and ACM Inroads (for which he is also a regular columnist). He is active in research within the software engineering and computer science education communities.

Leigh Ann DeLyser is a lifelong advocate of computer science education. At CSforALL, Leigh Ann oversees the administration, programs, and strategic plan of the organization and directs a research agenda to measure impact and inform future organizational efforts. Leigh Ann earned her PhD from Carnegie Mellon University in Computer Science and Cognitive Psychology, with a focus on CS education.

Andreas Mühling is an Assistant Professor for Computer Science Education at Kiel University. His research interests focus on teaching and learning programming in all stages of education, the perception of computer science as a scientific discipline, and methods of educational data mining, particularly in mixed-method research designs. He is engaged in cooperative discipline-based educational research outside of Computer Science, strengthening and shaping the role of computer science in primary and secondary education, and preparing future Computer Science teachers for their work.

Kylie Peppler is an Associate Professor of Informatics and Education as well as Director of the Creativity Labs at UC Irvine. Throughout her career, she has studied the creative uses of computer programming among youth communities and has focused most recently on the design and study of e-textile artifacts. This work has resulted in numerous publications, including a four-book curriculum through MIT Press as well as a co-edited volume titled, "Textile Messages: Dispatches from the World of E-Textiles and Education" through Peter Lang Publishing.

Anthony Robins is a Professor of Computer Science at the University of Otago, New Zealand. He is author of some of the most highly cited publications in computing education, and (with Professor Sally Fincher) the co-editor
of The Cambridge Handbook of Computing Education Research (in press). He has co-organized and participated in multinational research studies, and co-chaired and participated in various doctoral consortiums. He has worked for the Ministry of Education on new programming assessment standards and related instructional materials, for use in secondary schools.

Juha Sorva is a Senior University Lecturer at Aalto University, Finland. His research interests include the teaching and learning of introductory programming, learners’ understandings of programming concepts, instructional design in ebooks, program visualization, and online and blended learning.

David Weintrop is an Assistant Professor in the Department of Teaching & Learning, Policy & Leadership in the College of Education with a joint appointment in the College of Information Studies at the University of Maryland. His research focuses on the design, implementation, and evaluation of accessible and engaging computational learning environments. He is also interested in the use of technological tools in supporting exploration and expression across diverse contexts including STEM classrooms and informal spaces. His work lies at the intersection of design, computer science education, and the Learning Sciences.

Aman Yadav is a Professor in Educational Psychology and Educational Technology Program and Director of Masters of Arts in Educational Technology at Michigan State University. His research focuses on improving student experiences and outcomes in computer science and engineering classrooms at the K-16 level. Within this line of inquiry, he studies: (1) how to prepare pre-service and in-service teachers to teach computing ideas, such as how to integrate computational thinking ideas within subject areas; and (2) how to implement problem-based learning approaches to improve student outcomes in undergraduate computer science and engineering.

The three articles in this issue represent the broadened scope of Computer Science Education and its Editorial Board. In the first article, Aleata Hubbard reviews the research literature on pedagogical content knowledge (PCK) in secondary computing education. From 19 studies conducted in nine different countries mainly during the past decade she identifies five different conceptualizations of computing PCK. Three of these models are derived from models in other disciplines, thus offering frameworks for comparative research in computing PCK, while two models have been constructed inductively focussing on computing specifics. Collectively, Hubbard’s work outlines the state of the art in researching (secondary education) computing PCK and offers directions for future studies.

The second article by Jason West focuses on current developments in tertiary education. His article describes a process to analyze, validate, and synthesize interdisciplinary Data Science curricula. Using techniques from machine learning and natural language processing, curricula can be mapped to subject areas such as Coding, Statistics, Machine Learning, Visualization, and
Applications. As a result of this mapping, Aster assessments plots can be created and used to visualize focus areas of different curricula, making it easier to assess their depth and breadth across different institutions.

As Matti Tedre, Simon, and Lauri Malmi put it, “a history of a discipline is a telltale sign of a mature field”. Their article gives a detailed and accessible account of the development of computing education over the past 70 years. Starting from attempts to train people for technical jobs and ending with a current focus on computational problem-solving, the authors describe the theoretical foundations, characterizing debates, and curricular implications for four major epochs of computing education. They conclude that computing education has expanded and at the same time produced more specialized curricula. Major discussions have been wagered, e.g. with respect to languages or paradigms to be used, with respect to the “right” balance between theory and practice, or with respect to how broaden participation. The authors also note that computing education has continued to expand its use of reference disciplines.

In closing, we are excited about our new editorial board and continuing opportunities to broaden the scope of Computer Science Education. We hope that you, our readers, will agree. In the coming months, we will be working with our board to implement additional changes to the journal’s workflow to further align with our collective vision. In the meantime, we welcome any thoughts or questions you may have (cse.editors@gmail.com).

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