Computer Engineering Education

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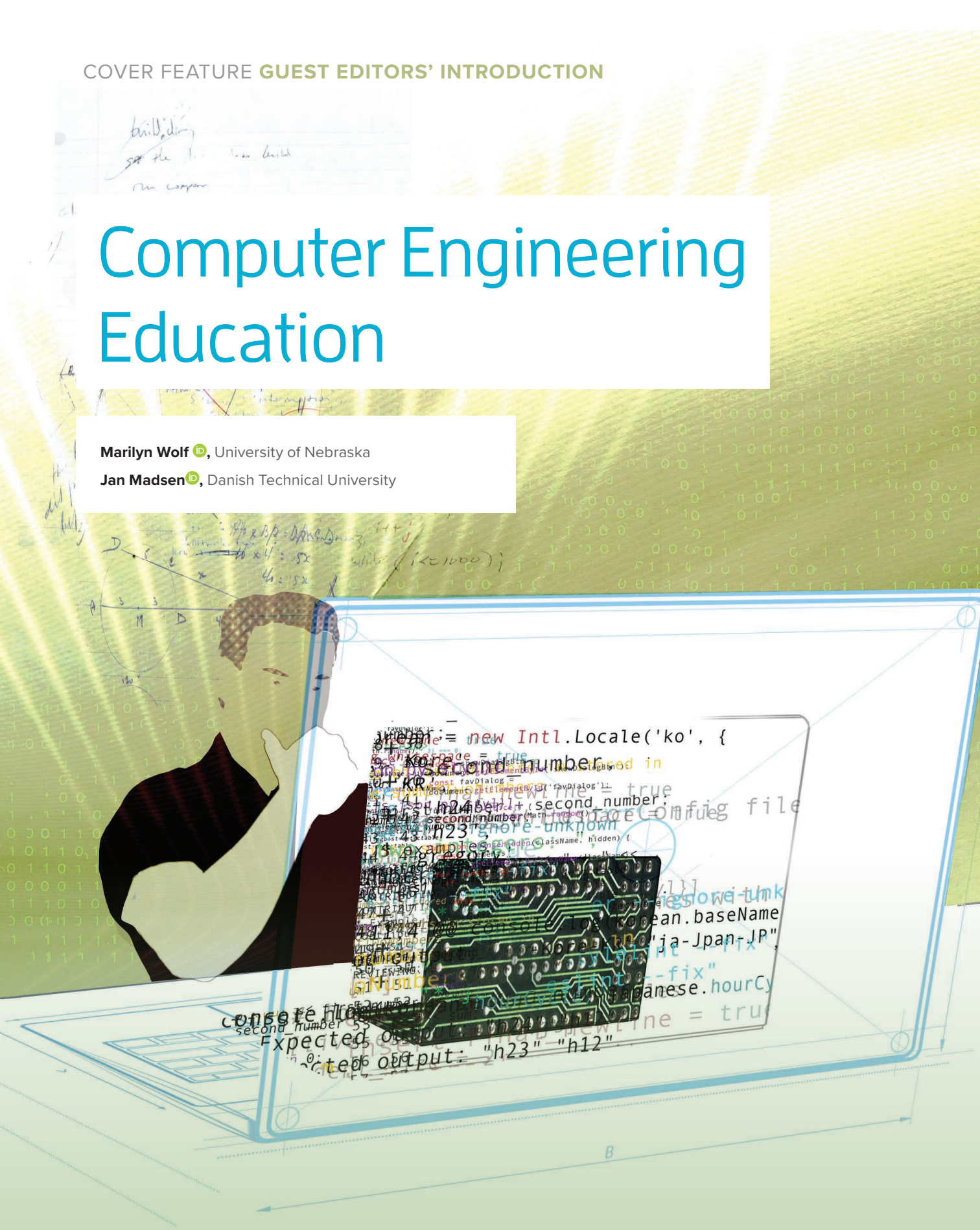

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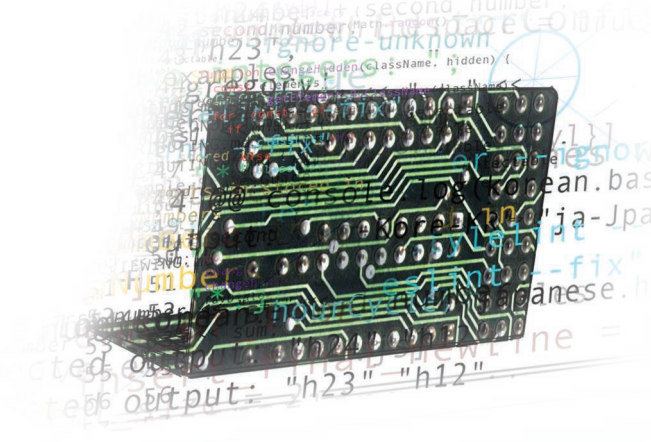

The global semiconductor renaissance gives impetus to an examination of computer engineering curricula. Computer engineering encompasses hardware and software aspects of computer system design, often with an application-driven focus.

This special issue surveys approaches to teaching computer engineering. Computer engineering is a distinct discipline that requires its own curriculum. The global semiconductor renaissance, in which many countries are increasing their support for the semiconductor industry, provides motivation to consider computer engineering curricula and learn from best practices.

Computer engineering encompasses both hardware and software topics. The design of digital systems is one foundation for computer engineering. Real-time and low-power software design encompasses software design for hardware-like requirements. The

APPENDIX: RELATED ARTICLES

A1. M. Schoeberl and L. Pezzarossa, "Chip design and verification in a computer engineering education," *Computer*, vol. 56, no. 11, pp. 20–29, Nov. 2023, doi: 10.1109/MC.2023.3291085.

A2. A.-J. Farcas and R. Marculescu, "Teaching edge AI at the undergraduate level: A hardware–software co-design approach," *Computer*, vol. 56, no. 11, pp. 30–38, Nov. 2023, doi: 10.1109/MC.2023.3295755.

A3. M. Liu, J. Gu, Z. Guo, and T. Zhao, "AempOS: An educational multiprocessor operating system," *Computer*, vol. 56, no. 11, pp. 39–47, Nov. 2023, doi: 10.1109/MC.2023.3306394.

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hardware/software interface of computer system architecture provides a bridge between these two topics.

Computers are used in a huge range of applications, ranging from data centers to implantable medical devices. Many different types of computer systems have been developed to meet the needs of different applications. Computer engineering provides techniques to create an appropriate hardware/software architecture for an application. Computer engineering methods can be used to build the appropriate hardware and software pieces. Design creation and verification are all within the scope of computer engineering.

This special issue includes three articles that discuss approaches to the hardware, software, and application aspects of computer engineering education.

The first article[A1] describes a curriculum option for computer engineering undergraduates to specialize in chip design. The article discusses the curriculum design to prepare students for careers in chip design and verification.

The second article[A2] describes a course on the hardware and software tradeoffs in the design of artificial-intelligence–enabled devices for the edge of the Internet. A hardware prototype provides students with the ability to design edge device software.

The third article[A3] describes an operating system designed to teach concepts in multiprocessor operating systems. The operating system helps students learn about parallelism and multiprocessors at the software level.

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