Computational Thinking

(Invited Keynote)

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***Abstract*— My vision for the 21st century, Computational Thinking, will be a fundamental skill used by everyone in the world. To reading, writing, and arithmetic, we should add computational thinking to every child's analytical ability. Computational thinking involves solving problems, designing systems, and understanding human behavior by drawing on the concepts fundamental to computer science. Thinking like a computer scientist means more than being able to program a computer. It requires the ability to abstract and thus to think at multiple levels of abstraction. In this talk I will give many examples of computational thinking, argue that it has already influenced other disciplines, and promote the idea that teaching computational thinking can not only inspire future generations to enter the field of computer science but benefit people in all fields.**

BIOGRAPHY

Jeannette M. Wing is the President's Professor of Computer Science and Head of the Computer Science Department at Carnegie Mellon University. She received her S.B., S.M., and Ph.D. degrees from the Massachusetts Institute of Technology. From 2007–2010 she was the Assistant Director of the Computer and Information Science and Engineering Directorate at the National Science Foundation.

Professor Wing's general research interests are in the areas of trustworthy computing, specification and verification, concurrent and distributed systems, programming languages, and software engineering. Her current interests are on the foundations of trustworthy computing, with a focus on the science of security and privacy.

Professor Wing was or is on the editorial board of twelve journals. She is a member of Computing Research Association Board and the Microsoft Trustworthy Computing Academic Advisory Board. She has been a member of many other advisory boards, including: the Networking and Information Technology (NITRD) Technical Advisory Group to the President's Council of Advisors on Science and Technology (PCAST), the National Academies of Sciences' Computer Science and Telecommunications Board, ACM Council, the DARPA Information Science and Technology (ISAT) Board, NSF's CISE Advisory Committee, the Intel Research Pittsburgh's Advisory Board, and the Sloan Research Fellowships Program Committee. She served as co-chair of NITRD from 2007–2010. She is a member of Sigma Xi, Phi Beta Kappa, Tau Beta Pi, and Eta Kappa Nu. She is a Fellow of the American Academy of Arts and Sciences, American Association for the Advancement of Science, the Association for Computing Machinery (ACM), and the Institute of Electrical and Electronic Engineers (IEEE).

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