

Computer Architecture

Sixty-five years ago, Alan Turing produced a proposal for the construction of a general-purpose computer, the Automatic Computing Engine, or ACE. Subsequently built at the U.K. National Physical Laboratory, it was briefly the fastest computer in the world. Although its architecture was quite different from the arrangement proposed by Von Neumann and others that eventually came to dominate the computing landscape, examining it gives us a chance to understand some of the tradeoffs that early computer architects explored. The panel will examine the ACE to provide a setting for the discussions that follow, in which they will explore some of the architectural tradeoffs that have been made in the past, are still being made today, and which will shape the direction of computing in the future. What would Alan Turing have thought about the impact that computers have had on society? What would he have thought about the warehouse-scale computing that makes possible a realization of Vannevar Bush's 1945 Memex vision? What about the possibility of quantum computing? The panelists will discuss these topics as well as the progress and future of academic computer architecture research.