

Podcast Name: *ACM ByteCast*

Episode: 68. Peter Lee

Welcome to the *ACM ByteCast* podcast, a series from the Association for Computing Machinery! The podcast features conversations with researchers, practitioners, and innovators at the intersection of computing research and practice about their experiences, lessons learned, and visions for the future of computing. In this episode, host Scott Hanselmen is joined by Peter Lee, President of Microsoft Research.

To begin, Scott and Peter reflect on their personal journeys through the evolution of computing, reminiscing about early systems like the PDP-11 and Commodore Amiga. Peter shares how early hands-on experiences shaped his career, noting how technologies once confined to labs and academia now permeate daily life. He highlights six major research advances embedded in today's smartphones—from VLSI design to software-defined wireless radios—as examples of computer science breakthroughs that have become essential to modern living. The discussion shifts to the idea of the "flip"—the moment when a new technology transitions from skepticism to standard practice. Peter uses medical ultrasound as a historical example and draws a parallel to Scott's experience with managing diabetes through a smartphone-based artificial pancreas.

Earlier in his career, Peter and many others subscribed to an overly optimistic belief in the inherent goodness of technology. But as the potential harms of technology—especially AI—have become more visible, there has been a growing need for ethical reflection. Being the first to build a powerful model like GPT-4 can require hundreds of millions or even billions of dollars, but once a breakthrough is achieved, others can follow at a fraction of the cost. This dynamic shapes the competitive landscape of AI and opens up important discussions around openness, transparency, and access in future research.

Scott and Peter explore the staggering acceleration of AI development, reflecting on how innovations that once took billions to create can now be replicated more affordably and quickly. This recurring pattern in technology—initial breakthroughs followed by rapid commoditization—feels especially shocking in the age of large language models, which are now accessible enough to run on consumer smartphones in airplane mode. Yet, even as these models become widespread, the depth and complexity of modern systems push them beyond any single person's comprehension. This increasing complexity is especially apparent in AI-assisted research. Peter also revisits the emotional stages he experienced while grappling with GPT-4's capabilities—ranging from skepticism to awe.

Human cognition is limited by working memory, while experience and knowledge reside in long-term memory. AI, with its expanding context windows and evolving memory architecture, is beginning to rival and even exceed human cognitive capacity in this regard. Peter notes that while transformers are imperfect at memory recall, there's no technical reason that future systems couldn't have flawless memory. The combination of perfect recall with intelligent associations might be the next defining leap toward AGI.

In closing, Peter shares about his efforts to transition from healthcare to computing research. Microsoft's need for medical technology research during the pandemic kept him in the healthcare space longer than he expected. Peter was the logical person to research if GBT was safe and logical to use for healthcare purposes. He continues to be pulled back into healthcare, a space he feels called to serve. Finally, Peter discusses the exciting innovations to look forward to from Microsoft Research, including AI for science.

Key takeaways:

- 0:01 – Introduction to the ACM ByteCast and guest Peter Lee.
- 0:56 – Reflections on decades of computing: from PDP-11 to mobile phones.
- 5:21 – The “flip” in technology adoption, especially in medicine.
- 7:38 – Concerns about how technology changes cognition and society.
- 11:18 – The evolving importance of ethics in computer science.
- 13:11 – The economics and accessibility of building frontier AI models.
- 17:19 – Complexity beyond human comprehension and AI-generated proofs.
- 20:21 – The emotional journey of adopting GPT-4 and anthropomorphism in AI.
- 26:30 – The role of memory and context window in perceived AGI.
- 29:09 – From computing research to healthcare.
- 34:55 – Exciting upcoming innovations from Microsoft Research.

Links

Learn more about [Peter Lee](#).

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