

Network–AI Convergence: Communication Empowers AI, AI Transforms Communication



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Abstract:

The convergence of communication networks and artificial intelligence is transforming the foundations of digital infrastructure. Traditionally, networks and AI evolved along separate technological trajectories, but their integration is now accelerating a shift from “communication for connectivity” to “communication for intelligence.” Communication systems increasingly provide the computational, sensing, and data-distribution backbone that enables AI to operate at scale. At the same time, AI is reshaping how networks are built, controlled, and optimized—driving new levels of automation, adaptability, and performance from the radio layer to end-to-end orchestration.

This talk explores the emerging paradigm of Network–AI Convergence and highlights the concept of the AI-Native Network, in which intelligence is embedded as a fundamental architectural function rather than an add-on capability. We introduce recent research advances and implementation examples across AI-driven RAN design, network optimization, digital twin-based control, and autonomous service management. Through these developments, we illustrate how the mutual reinforcement between communication and AI will define the next generation of network infrastructure and enable a more resilient, scalable, and intelligent society.

Bio:

Akihiro Nakao received his B.S. (1991) in Physics, M.E. (1994) in Information Engineering from the University of Tokyo. After working at the IBM in US and the IBM Tokyo Research Laboratory, he earned both his M.S. and Ph.D. degrees in Computer Science from Princeton University. In 2005, he was appointed as Associate Professor, and in February 2014, as Professor in Applied Computer Science, at Interfaculty Initiative in Information Studies, Graduate School of Interdisciplinary Information Studies, the University of Tokyo. Since 2020, he has been a special adviser to the President of the University of Tokyo (-present). In April 2021, he has moved to School of Engineering, the University of Tokyo (-present), and since then he has been serving as Director, Collaborative Research Institute for NGCI, (Next-Generation Cyber Infrastructure) , the University of Tokyo (-present). In 2024, he was appointed Co-Chair of XGMF (XG Mobile Promotion Forum) (-present). In October 2025, he has been a department head of systems innovation of the University of Tokyo (-present).

His research interests lie in information science and information and communication.

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