



LLMs for NextG Communication Networks: Fundamentals, Key Techniques, and Future Directions

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VENUE CS Seminar Room, Y6405, 6th Floor,
Yellow Zone, Yeung Kin Man Academic
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ABSTRACT

Large Language Models (LLMs) are transforming the landscape of artificial intelligence and are poised to play a pivotal role in the evolution of next-generation (NextG) communication networks. Beyond their remarkable capabilities in natural language understanding and generation, LLMs offer new opportunities for network intelligence, automation, optimization, and autonomous decision-making. We will start with a brief overview of LLM fundamentals and practical considerations for deployment. Next, we highlight key techniques and case studies, including self-refined LLMs for network traffic prediction, in-context learning for transmission power optimization, and multi-LLM debate frameworks for complex task planning in 6G networks. Together, these studies showcase how LLMs can advance network prediction, optimization, and automated planning. We conclude by outlining future directions to enable intelligent NextG Communication Networks.

BIOGRAPHY

Dr. Steve Liu is a Full Professor of Machine Learning, and a Full Professor of Computer Science at Mohamed bin Zayed University of Artificial Intelligence. (MBZUAI). He is a Full Professor in the School of Computer Science, and also a Full Professor (Courtesy Appointment) of Mathematics and Statistics at McGill University, where he has been a faculty member since 2007. Dr. Liu has held a range of leadership and administrative roles across both academia and industry. He served as Vice President of R&D, Chief Scientist, and Co-Director of the Samsung AI Center in Montreal, where he led research and development of AI innovations across telecommunications, mobile computing, IoT, and embodied AI. He was also Chief Scientist at Tinder Inc., where he directed research and innovation for one of the world's largest dating and social discovery platforms, valued at over \$10 billion. In academia, Dr. Liu served as Associate Vice President of Research at MBZUAI, where he led research strategy, operation, and innovation. He also held the Samuel R. Thompson Chair Associate Professorship in the Department of Computer Science and Engineering at the University of Nebraska–Lincoln. Earlier in his career, he worked at Hewlett-Packard Labs in Palo Alto and the IBM T. J. Watson Research Center in New York. Dr. Liu is an IEEE Fellow, and a Fellow of the Canadian Academy of Engineering. He is an associate member at the Quebec AI Institute (Mila), and McGill Center for Intelligent Machines (CIM). He was the chair of ACM SIGBED from 2021-2025. His research interests focus on AI/Machine Learning, Sustainable Computing, IoT, Financial AI, and Cyber-Physical Intelligent Systems. He has authored/co-authored 6 books/monographs and published over 400 research papers in major peer-reviewed international journals and conference proceedings, and received 10+ best paper awards from IEEE or ACM. Dr. Liu is also a serial entrepreneur and has advised/co-founded several high-tech startups.

All are welcome!



In case of questions, please contact Prof MA Chen at chenma@cityu.edu.hk, or visit the CS Departmental Seminar Web at <https://www.cs.cityu.edu.hk/events/cs-seminars/recent-cs-colloquiums>.