CBS Research Seminar
Neural Modeling of Dynamic Representations in Language Learning and Communication

Date: **6 Dec 2024 (Fri)**

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Language: **English**

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Zoom ID: **925 2441 8249**
Passcode: **557055**
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Presented by

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ABSTRACT: Language learning and processing are interconnected cognitive and neural processes that involve shared brain networks and mechanisms for acquiring and utilizing language knowledge to achieve effective communication. Understanding how the brain efficiently encodes, transforms, and shares language representations is essential for unraveling the complexities of human language cognition. In this talk, I will examine how the brain transforms and shares speech codes and linguistic units between speakers and listeners to facilitate effective communication, as well as how language learning helps us to establish efficient language representations in the brain that support communication processes. By employing a combination of predictive modeling and multivariate representation modeling approaches, we can not only understand how the brain represents language information during processing and learning at the group level but also account for individual differences in communication and learning success. Our recent findings highlight the involvement of multiple brain networks that dynamically contribute to the formation of efficient neural codings of language through a blend of predictive coding and reinforcement learning mechanisms. These findings suggest that effective speech communication relies on robust neural encoding and the sharing of representations closely linked to language learning mechanisms. This line of research offers a new perspective on the neural basis of language cognition, with implications for the development of educational strategies, the rehabilitation of language disorders, and the design of individualized training protocols to enhance language outcomes.

SPEAKER BIO: Professor Feng Gangyi is an Associate Professor in Neurolinguistics and Psychology of Language. He is an awardee of China's National Excellent Young Scientists Fund (国家级人才项目获得者：国家优秀青年科学基金项目（港澳）). He received his undergraduate and doctoral degrees in Psychology from South China Normal University. He completed his postdoctoral training in the Cognitive Neuroscience of Language at the Chinese University of Hong Kong and the University of Texas at Austin in the US. Before his current position, he was a Research Assistant Professor at the Chinese University of Hong Kong. He teaches courses in Neurolinguistics, Research Methods in Language Sciences, and Special Topics in Psycholinguistics and Neurolinguistics. Professor Feng's research employs a range of contemporary cognitive neuroscience research approaches, including event-related potentials (ERP), functional magnetic resonance imaging (fMRI), and diffusion tensor imaging (DTI), as well as systems neuroscience techniques such as multivariate neural decoding and connectivity pattern analyses, to gain a deeper understanding of the cognitive and neural mechanisms underlying language learning, speech, and lexical-semantic processing in healthy adults and clinical populations. His research has been published in many high-profile academic journals, including PNAS, the Journal of Neuroscience, Cerebral Cortex, Neuroimage, Human Brain Mapping, and Neurobiology of Language. He has received funding for his research from various external and university sources, including the General Research Fund (GRF), Collaborative Research Fund (CRF), National Natural Science Foundation of China (NSFC), Innovation and Technology Fund (ITF), and National Institutes of Health (NIH).