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Computational Microscopy for Advanced Battery Characterization

Date: 1 June, 2026 (Monday)
Time: 11:00 a.m. - 12:00 noon
Venue: Room 734 & 735
Haking Wong Building
HKU



Speaker: Professor Jizhou Li
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Department of Electronic Engineering
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Abstract:

The rapid evolution of battery technologies is driving demand for deeper and more precise characterization methods to unravel the complex mechanisms governing battery performance and degradation. X-ray microscopy has become an indispensable tool for non-destructive, high-resolution investigation of battery materials and architectures, enabling visualization of internal structures, interfaces, and dynamic processes during operation. However, conventional techniques face significant challenges in data curation, analysis, and interpretation for specific tasks, requiring advanced computational methods to further enhance their capabilities. In this talk, I will introduce our recent work on developing computational microscopy techniques and applying them to the characterization of advanced battery materials. By creating synergy among X-ray microscopy, advanced computing, and scientific discovery, these advances can provide unprecedented insights into the evolution of materials within electrodes and ultimately drive technological innovation in battery materials science.

Biography:

Jizhou Li is currently a Vice-Chancellor Assistant Professor in the Department of Electronic Engineering at The Chinese University of Hong Kong. He previously worked at Stanford University, the Howard Hughes Medical Institute (HHMI), SLAC National Accelerator Laboratory, and City University of Hong Kong. With an interdisciplinary background in mathematics and engineering, Dr. Li is dedicated to advancing transdisciplinary imaging science by integrating inverse problem theory, computational microscopy, and materials characterization.

His recent research focuses on developing computational X-ray and electron microscopy methods, particularly for characterizing battery materials, to accelerate the design and engineering of high-performance battery materials. Dr. Li has published more than 60 peer-reviewed articles in prestigious journals and conferences, including *Science*, *Nature*, *Cell*, journals in the Nature and Cell Press portfolios, *PNAS*, *Advanced Materials*, and *IEEE Transactions*. He has received multiple awards from IEEE and SIAM, including two Best Conference Paper Awards from the IEEE Signal Processing Society and the IEEE Engineering in Medicine and Biology Society, as well as a CVPR Best Paper Finalist from the IEEE Computer Society. He is a Senior Member of IEEE.

ALL INTERESTED ARE WELCOME

For further information, please contact Professor W.X. Song at 3917 7910.