NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Materials Science and Engineering
College of Engineering

MSE Faculty Seminar

AI and Robotics to Design and Create Sustainable Materials

Associate Professor Kedar Hippalgaonkar

Abstract

In this presentation I will describe how we developed tools for accelerating materials innovation by combining AI, machine learning, robotics and high-throughput simulations. I will provide examples of how we've used these to not only discover new sustainable materials in our research, but also translate technology into market with the discovery of a material that captures CO2 with textiles through our start-up, Xinterra. Lastly, I will end with a forward-looking view of how Generative Models can help in AI for materials discovery.

Biography

Nanyang Assistant Professor Kedar Hippalgaonkar is a NRF Fellow (Class of 2021) and a joint appointee with the Materials Science and Engineering Department at Nanyang Technological University (NTU) and as a Senior Scientist at the Institute of Materials Research and Engineering (IMRE) at the Agency for Science Technology and Research (A*STAR). He is leading the Accelerated Materials Development for Manufacturing (AMDM) program from 2018-2023 focusing on the development of new materials, processes and optimization using Machine Learning, AI and high-throughput computations and experiments in electronic and plasmonic materials and polymers. He was also leading the Pharos Program on Hybrid (inorganic-organic) thermoelectrics for ambient applications from 2016-2020.

He has published over 70 research papers, has co-founded a startup (Xinterra, Inc.), won the MOE START Award in 2021 and was nominated as a Journal of Materials Chemistry Emerging Investigator in 2019. He was recognized as a Science and Technology for Society Young Leader in Kyoto in 2015. For his outstanding graduate research, he was awarded the Materials Research Society Silver Medal in 2014. Funded through the A*STAR National Science Scholarships, he graduated with a Bachelor of Science (Distinction) from the Department of Mechanical Engineering at Purdue University in 2003 and obtained his Doctor of Philosophy from the Department of Mechanical Engineering at UC Berkeley in 2014. While pursuing his doctoral studies, he conducted research on fundamentals of heat, charge and light in solid state materials.

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Hosted by: Associate Professor Nripan Mathews

Office of Associate Chair (Research)
School of Materials Science & Engineering
Email: vd-mse@ntu.edu.sg
www.ntu.edu.sg/mse