

Mapping Information Connectivity in Materials Science

ABSTRACT – Materials Science as a discipline strives to understand the relationships between structure- form and function of material. These relationships are inherently multiscale in nature. Hence unraveling and discovering connections may be viewed as a high dimensional data problem and the challenge lies in finding connections embedded in this high dimensional space. In this presentation we provide examples of how we can harness the tools of mapping low dimensional projections from high dimensional data to discover and uncover relationships / connections that are not easily detected or overlooked by either experimental or computational means. It is proposed that the metaphor of the ‘connectome’ concept developed in the field of neurosciences can serve as a powerful paradigm for harnessing data driven science to discover the connections across length scales in materials behavior.



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SPEAKER BIO – Krishna Rajan is the SUNY Distinguished Professor and Erich Bloch Chair of the Department of Materials Design and Innovation (MDI) at the University at Buffalo (UB). He has pioneered the field of Materials Informatics and data driven discovery in materials science and engineering and its impact on characterization, processing, and modeling of materials. He has received numerous recognitions including the Alexander von Humboldt Award from Germany, the CSIRO- Australia Distinguished Visiting Scientist Award, the CNRS Visiting Professorship from France and the Presidential Lecture Award from the National Institute of Materials Science, Japan.

Dr. Rajan received his undergraduate degree in Metallurgy and Materials Science from the University of Toronto followed by a doctorate in Materials Science from MIT with a minor in Science and Technology policy. He subsequently held post-doctoral appointments at MIT and Cambridge University. He was a staff scientist at the National Research Council of Canada, followed by faculty positions at Rensselaer Polytechnic Institute and Iowa State University before coming to the University at Buffalo as the founding chair of the MDI department. It is the first department that has its research and curriculum built around an informatics perspective of materials science and engineering.