Esteemed Colleagues,

It is my pleasure to write this letter of recommendation to support the application of my colleague, Dr. Manav Vohra for participation in the CyberTraining program at UMBC. Dr. Vohra joined the Department of Civil and Environmental Engineering at Vanderbilt in September 2017 as a Research Assistant Professor in my group. His work has focused on the development of efficient techniques for uncertainty quantification (UQ) in atomistic simulations and chemical kinetics applications, supported by NSF; and more recently for defect characterization and control in additive manufacturing, supported by NIST.

Dr. Vohra has managed significant breakthrough contributions through his efforts in a relatively short span of about a year at Vanderbilt. Specifically, he has demonstrated efficient techniques for response surface construction, global sensitivity analysis, and Bayesian calibration using approaches for dimensionality reduction. These techniques were implemented for characterizing the variability in bulk thermal conductivity predictions of silicon due to uncertainty in the Stillinger-Weber potential parameters using non-equilibrium molecular dynamics. Dr. Vohra’s efforts led to the discovery of a 1-dimensional active subspace indicating that the variability could be captured in terms of a single parameter. Additionally, for a hydrogen-oxygen reaction kinetics application, he demonstrated that the dimensionality of the problem could be effectively reduced from 36 to 1. These efforts have tremendous potential for reducing the computational effort associated with UQ in scientific applications by several orders of magnitude. His work at Vanderbilt has so far led to three publications in highly prestigious scientific journals, and an NSF travel award for presenting his work at a USACM workshop at Johns Hopkins University.

The CyberTraining program seems like a remarkable opportunity for young and energetic researchers like Dr. Vohra to advance their skills in Machine Learning, Big Data, and HPC. I am confident that Dr. Vohra will exploit this opportunity to make an impactful contribution to the research effort in the program as well as his on-going and future research efforts. Therefore, I strongly recommend him for the program.

Best Regards,

Sankaran Mahadevan