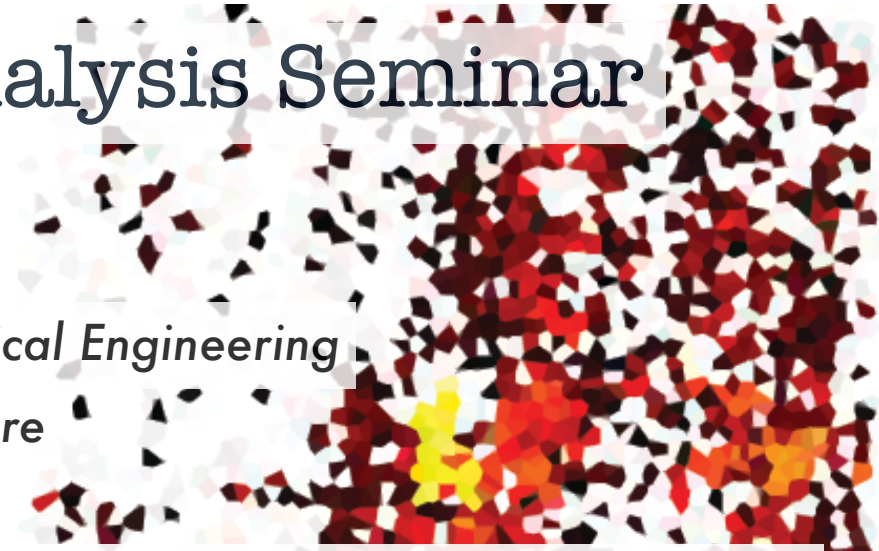
Brain Image Analysis Seminar



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From Spectral Laplace-Beltrami Wavelets and Geometric Convolutional Neural Network for Signal Processing and Classification

February 19, 2019 9:30am

1111 Biotechnology Center, 425 Henry Mall

Abstract: In the first part of the talk, I will introduce spectral Laplace-Beltrami wavelets and its computational algorithm. I will then demonstrate its use for smoothing and classification of the data defined on smooth surfaces embedded in the 3-D Euclidean space. In the second part of the talk, I will discuss that the spectral Laplace-Beltrami Wavelets can be used for the construction of geometric convolutional neural network (CNN) and then introduce a vertex-based geometric CNN algorithm for regular surfaces in which translation and downsampling on surfaces can be the same as those in the regular grid. I will show the use of this method for the prediction of Alzheimer's disease.

Short Bio: Dr. Qiu is Dean's Chair Associate Professor at the Department of Biomedical Engineering and Clinical Imaging Research Centre at National University of Singapore. She is also a principal investigator at Singapore Institute for Clinical Sciences of Agency for Science Technology and Research (A*STAR). Dr. Qiu received her BS in Biomedical Engineering from Tsinghua University in 1999, MS degrees in Biomedical Engineering and Applied Mathematics and Statistics from University of Connecticut in 2002 and from the Johns Hopkins University in 2005, respectively. She obtained her PhD degree at the Johns Hopkins University in 2006. After one-year postgraduate training, she joined the National University of Singapore as assistant professor and launched her own Laboratory for Medical Image Data Sciences at both the Faculty of Engineering and the School of Medicine. Dr. Qiu has been devoted to innovation in computational analyses of complex and informative datasets comprising of disease phenotypes, neuroimage, and genetic data to understand the origins of individual differences in health throughout the lifespan. She received Faculty Young Research Award, 2016 Young Researcher Award of NUS. She has recently been appointed as endowed "Dean's Chair" associate professor to honour her outstanding research achievements. She serves on the program committee of Organization of Human Brain Mapping and editors of Neuroimage and Frontiers in Neuroscience.

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