

Imaging Seminar - Department of Mathematics

Date and Time: MONDAY FEBRUARY 2 , 2015, 2-3 PM

Location: PGH 646

Title: MODELING BRAIN CIRCUITRY OVER A WIDE RANGE OF SCALES.

Speaker: DR. PASCAL FUA, EPFL.

Abstract: Electron microscopes (EM) can now provide the nanometer resolution that is needed to image synapses, and therefore connections, while Light Microscopes (LM) see at the micrometer resolution required to model the 3D structure of the dendritic network. Since both the arborescence and the connections are integral parts of the brain's wiring diagram, combining these two modalities is critically important.

In this talk, I will therefore present our approach to building the dendritic arborescence, to segmenting intra-neuronal structures from EM images, and to registering the resulting models. I will also argue that the techniques that are in wide usage in the Computer Vision and Machine Learning community are just as applicable in this context.

Bio: Pascal Fua received an engineering degree from Ecole Polytechnique, Paris, in 1984 and the Ph.D. degree in Computer Science from the University of Orsay in 1989. He joined EPFL (Swiss Federal Institute of Technology) in 1996 where he is now a Professor in the School of Computer and Communication Science. Before that, he worked at SRI International and at INRIA Sophia-Antipolis as a Computer Scientist. His research interests include shape modeling and motion recovery from images, analysis of microscopy images, and Augmented Reality. He has (co)authored over 300 publications in refereed journals and conferences. He is an IEEE Fellow and has been an Associate Editor of IEEE journal Transactions for Pattern Analysis and Machine Intelligence. He often serves as program committee member, area chair, and program chair of major vision conferences and has cofounded two spinoff companies.