OIST Workshop

Hosted by Optical Neuroimaging Unit (Kuhn Unit)

Dr. Andrea Giovannucci

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DATE: **Thursday, February 21st, 2019**
TIME: **9:00-12:00**
VENUE:**C015, Level C, Lab 1**

CaImAn: An open source tool for scalable Calcium Imaging data Analysis

Advances in fluorescence microscopy enable monitoring larger brain areas in-vivo with fine temporal and spatial resolution. The resulting data rates require reproducible analysis pipelines that are reliable, fully automated, and scalable to datasets generated over the course of months. CaImAn is an open-source library for calcium imaging data analysis that provides automatic and scalable methods to address problems common to pre-processing, including motion correction, neural activity identification, and registration across different sessions of data collection. CaImAn also enables real-time analysis on streaming two-photon imaging data, and therefore opens the path to novel closed-loop experiments. The tutorial will introduce the theory underlying calcium imaging data analysis in CaImAn and demonstrate two typical use-case scenarios.

Speaker Bio

Dr. Giovannucci recently joined the UNC/NCSU Biomedical engineering department. Prior to his appointment as Assistant Professor in Neural Engineering, Dr. Giovannucci was a machine learning data scientist at the Flatiron Institute (Simons Foundation) and a postdoctoral fellow (experimental neuroscience) at the Princeton Neuroscience Institute. At the Flatiron Institute, Dr. Giovannucci's research focused on developing algorithms and tools for the analysis of large imaging datasets and animal behavior. This effort culminated in an open source software suite – CaImAn – that is widely employed by the neuroscience community and includes algorithms to solve several preprocessing problems. While at Princeton University, Dr. Giovannucci pioneered the use of genetically encoded calcium indicators to image neurons in the cerebellum of awake learning mice, and applied them to investigate coding properties of cerebellar neurons during motor learning. Dr. Giovannucci holds a Ph.D. in computer science from Universitat Autònoma de Barcelona in Spain and a B.S. in electrical engineering from Politecnico di Milano in Italy.

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