



Learning Representations of Cellular Morphology

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Microscopy images are fundamental for biological research, and quantifying cellular phenotypes is at the core of numerous applications in drug discovery, functional genomics and personalized medicine. However, quantifying cellular morphology can be a challenging problem because there is no universal reference to align the visual patterns observed under the microscope, and the structures of interest may also be unknown ahead of time. Deep learning offers a robust way to automatically identify and extract meaningful image-based representations, and specifically, self-supervised learning has the ability to discover biologically relevant structures in imaging data without prior knowledge or manual annotations. In this talk, I will show how image-based profiling powered by deep learning can support various biological studies at large scale, including phenotyping the impact of cancer variants, profiling subcellular protein localization, and predicting compound bioactivity.

ABOUT the SPEAKER

Juan C. Caicedo is an Investigator at the Morgridge Institute for Research and an Assistant Professor in the Department of Biostatistics and Medical Informatics at UW-Madison. His work focuses on the use of deep learning and machine learning to analyze microscopy images of cells and other biological data. He completed his PhD in the National University of Colombia and worked as a research intern at Queen Mary University of London, Microsoft Research, and Google Research. He also worked as a postdoctoral researcher at the University of Illinois at Urbana-Champaign, and at the Broad Institute of MIT and Harvard, where he also had an independent research laboratory.

Monday, September 25 at Noon
LOCATION CHANGE: Union South Landmark A & B (3rd floor)

