

Clarkson University
Department of Chemical and Biomolecular Engineering
SEMINAR (ZOOM)

“Modeling Uncertainty in Biology”

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Noise can be found in almost all aspects in biology. While this noise can be a nuisance—for example, it may contaminate important signals that leads to uncertainty in biological findings—many a times such noise has functional roles. In this talk, I will give vignettes of research in my group that delves into the use of mathematical modeling to capture biological noise and uncertainty across scales. At the organism level, I will describe our recently published study of heat shock response and its heterogeneity in a population of *Caenorhabditis elegans*, where mathematical modeling enables the identification of proteostasis as the source of this heterogeneity. In the remainder of the talk, I will describe my group’s work that drills down to individual cells, specifically on the analysis of single-cell transcriptomic data, with a particular focus on stem cell differentiation.

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<https://clarkson.zoom.us/j/94168950651>



Rudi Gunawan is an Associate Professor in the Department of Chemical and Biological Engineering at University at Buffalo of the State University of New York (SUNY). His research expertise is in the area of computational systems biology and bioinformatics. His laboratory creates and applies enabling and innovative tools for the extraction of mechanistic and actionable insights from biological data, based on rigorous mathematical underpinnings, systems modeling and analysis, and machine learning and optimization algorithms. The group’s research findings have been disseminated in 90 peer-reviewed publications in prominent journals of systems biology, bioprocess engineering, bioinformatics, biology, and biogerontology. Dr. Gunawan is a co-recipient of two Best Paper awards from the Journal of Process Control and Computers and Chemical Engineering journal in 2008.