

Workshop: *Deconstructing Biochemical Networks*
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Stochasticity and Designs of Genetic Networks

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Abstract

Cells must respond to environmental changes to remain viable, yet the information they receive is often noisy. Through a biochemical implementation of Bayes's rule, I will show that genetic networks can act as inference modules, inferring from intracellular conditions the likely state of the extracellular environment and regulating gene expression appropriately. Our interpretation is supported by experimental data from the lac operon and should provide a basis for both understanding more complex cellular decision-making and designing synthetic inference circuits.