

Towards Optimal Virtual Patients: Extending the Reach of Predictive Biosimulation in the Drug Discovery Pipeline

Speaker: Samik Ghosh

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Venue: WH 413 (CReWMaN Lab)

Abstract:

In the post genomic era, biology has undergone a paradigm shift from being essentially an "observational science" to a "quantitative science" powered by computational tools, mathematical models and simulation methodologies. In Silico biology bears the promise of expediting the drug discovery pipeline, in various stages of drug design and development. In this talk, we look into the creation of "virtual patients", parameterized mathematical models of disease pathophysiology at various stages of progression in clinical patients. In particular, we look into an adaptive online optimization technique which creates a suite of virtual patients who exhibit the appropriate steady-state and dynamic behaviors subject to a wide spectrum of environmental and clinical conditions. Such an optimal suite of virtual patients provides a powerful predictive platform for simulating the effects of novel drug targets on a population set, significantly reducing the cost of real-life clinical trials.

The work to be presented was done by the author in Fall 2006, while working as an optimization engineering intern in the In Silico Research & Development Division of Entelos Inc. (www.entelos.com), a biosimulation and systems biology modeling company providing predictive biosimulation tools for pharmaceutical companies.

Biography:

Samik Ghosh is a third year PhD student in the Biological Networking Research Group at the Center for Research In Wireless Mobility and Networking (CReWMaN). His primary research area lies in modeling and simulation of biological processes. His dissertation work is focused on developing a discrete event based stochastic biosimulation platform for modeling single cell dynamics. He also pursues research interests in wireless mesh networks and mobile applications for handheld devices.