FACULTY OF THE CENTER FOR BIOENGINEERING

CBEPeople

Linda Petzold

Systems Biology & Computation

Professor, Departments of Computer Science & Mechanical Engineering

Director, Computational Science & Engineering Graduate Emphasis

CONTACT

petzold@cs.ucsb.edu

Phone: (805) 893-5362

Office Location: 5107 Harold Frank Hall

Dept of Computer Science

University of California,

Santa Barbara, CA. 93106

EDUCATION

University of Illinois at Urbana-Champaign
Ph.D. in Computer Science (1978)

University of Illinois
B.A. in Mathematics/Computer Science (1974)

HONORS AND AWARDS

SIAM Prize for Distinguished Service to the Profession (2016)

Honorary Doctorate, Uppsala University, Sweden (2015)

SIAM/ACM Prize in Computational Science and Engineering (2013)

Fellow, Association of Computing Machinery (2011)

Fellow, Society for Industrial & Applied Mathematics (SIAM, 2009)

Continued on other side

RESEARCH OVERVIEW

The Petzold group is focused on modeling, analysis, simulation and software, applied to multiscale, networked systems in biology in biology, ecology and medicine. My research group has been developing advanced algorithms for discrete stochastic simulation of systems where the fate of a few key molecules can make a big difference to important outcomes. We engage with experimentalists and with medical researchers through the analysis of data and the development of mathematical models that yield insight and suggest new directions for research. Current collaborations range from biology (circadian rhythm (jet lag), and cell polarization), to medicine (coagulopathy, and post-traumatic stress disorder and ALS), and ecology (chytrid disease in frogs), to social networks (sentiment analysis and opinion dynamics). A hallmark of our group is the development of state of the art software for the simulation of a wide range of problems.

Group Website: www.cs.ucsb.edu/people/faculty/petzold

FACULTY OF
THE CENTER FOR
BIOENGINEERING

CBEPeople

HONORS AND AWARDS

Fellow, American Society of Mechanical Engineers (2008)

Fellow, American Association for the Advancement of Science (2005)

Member, National Academy of Engineering (2004)

AWM/SIAM Kovalevsky Prize, 2003

SIAM Dahlquist Prize (1999)

Wilkinson Prize for Numerical Software (1991)

Selected Publications

Hellander S, & Petzold L (2016) Reaction Rates for a Generalized Reaction-Diffusion Master Equation. Phys. Rev. E 93, 013307.

Lawson M J, Petzold L, Hellander A (2015) Accuracy of the Michaelis-Menten Approximation When Analysing Effects of Molecular Noise. J. R. Soc. Interface 12:20150054.

Wu S, Fu J, Petzold LR (2015). Adaptive Deployment of Model Reductions for Tau-Leaping Simulation. J. Chem. Phys. 142, 204108.

Abel, J. H., Drawert, B., Hellander, A., & Petzold, L. R. (2015, August). GillesPy: A Python Package for Stochastic Model Building and Simulation. FOSBE 2015 Conference Proceedings, Boston, MA.

Doostparast, A. Petzold, L., & Cohen, M. (2015, November). Direct Higher Order Fuzzy Rule-based Classification System: Application in Mortality Prediction. Proceedings of the IEEE Internation Conference on Bioinformatics & Biomedicine (IEEE BIBM 2015), Washington D. C.

Thakur, G. S., Daigle Jr., B. J., Dean, K. R., Zhang, Y., Rodriguez-Fernandez, M., Hammamieh, R., Yang, R., Jett, M., Palma, J., Petzold, L. R., & Doyle III, F. J. (2015). Systems Biology Approach to Understanding Post-Traumatic Stress Disorder. Mol. BioSyst., 2015, 11, 980.

Thakur, G., Daigle Jr., B., Petzold, L. R. & Doyle, F. (2014). A Multivariate Ensemble Approach for Identification of Biomarkers: Application to Breast Cancer. Proceedings of the 19th IFAC World Congress.

Griesemer, M., Young, C., Robinson, A. S. & Petzold, L. R. (2014). BiP Clustering Facilitates Protein Folding in the Endoplasmic Reticulum. PLoS Comput. Biol. 10(7): e1003675.

Hellander, A., Lawson, M., Drawert, B. & Petzold, L. (2014). Local Error Estimates for Adaptive Simulation of the Reaction-Diffusion Master Equation via Operator Splitting. J. Comp. Phys. 266, pp. 89-100.

Sturrock, M., Hellander, A., Aldakheel, S., Petzold, L. R. & Chaplain, M. A. J. (2014). The Role of Dimerisation and Nuclear Transport in the Hes1 Gene Regulatory Network. Bull. Math Biol. 76(4):766-98.

Fu, J., Wu, S., Li, H. & Petzold, L. R. (2014). The Time Dependent Propensity Function for Acceleration of Spatial Stochastic Simulation of Reaction-Diffusion Systems. J. Comp. Phys. 274, pp. 524–549.

An, S., Harang, R., Meeker, K., Granados-Fuentes, D., Tsai, C., Mazuski, C., Kim, J., Doyle III, F. J., Petzold, L. R. & Herzog, E. D. (2013). A Neuropeptide Speeds Circadian Entrainment by Reducing Intercellular Synchrony. Proceedings of the National Academy of Sciences.

Gillespie, D. T., Hellander, A. & Petzold, L. R. (2013). Perspective: Stochastic Algorithms for Chemical Kinetics. J. Chem. Phys. 138, 170901.