Peter C. St. John

I am a professional scientist with years of experience in using computational approaches to extract insight from data and building simple, understandable models to explain observed results.

Contact Information

Location: Golden, CO 80401
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Experience

National Renewable Energy Lab (2015 - Present)

Postdoctoral Scholar

- Used machine learning techniques to develop a model to predict the tendency of a molecule to form soot from directly from its structure.
- Developed models of microbial metabolism to determine means of improving product yields through genetic engineering. Helped to develop and maintain python packages for such purposes, including `cobrapy` and `d3flux`.

Education

University of California, Santa Barbara (2010-2015)

Ph.D., Department of Chemical Engineering, Santa Barbara, California

- Thesis: Computational analysis of the mammalian circadian clock, with a focus on elucidating the functional design consequences of the underlying genetic regulatory network.
- GPA: 3.68

Tufts University (2006 - 2010)

BS, Chemical and Biological Engineering, Medford, Massachusetts

- GPA: 3.79

Research Expertise

- *Machine Learning*: Neural networks, preprocessing methods, hyperparameter optimization
- *Satistics*: uncertainty analysis, bayesian methods, model selection
- *Optimization*: Linear programming, nonlinear programming, stochastic
- *Nonlinear systems*: Ordinary differential equations, collocation methods, sensitivity analysis

Software Expertise

- *Python*: thorough familiarity with the PyData stack, including relational databases (`pandas`), machine learning methods (`sklearn`), and compiled extensions (`cython`, `swig`, `numba`)
- *Development*: unittests, continuous integration, and helped to develop software for large open-source projects.
- Very comfortable with unix environments, HPC, and front-end stack languages (html, css, and javascript)

Selected Peer-reviewed Publications

Salvachúa D., Smith, H., **St. John, P.C.**, Mohagheghi, A., Peterson, D.J., Black, B.A., Dowe, N., and G.T. Beckham. Succinic acid production from lignocellulosic hydrolysate by Basfia succiniciproducens (2016) *Bioresource Technology*, (214) pp. 558-566.

Abel, J.H., Meeker, K., Granados-Fuentes, D., **St. John, P.C.**, Wang, T.J., Bales, B.B., Doyle F.J. III, Herzog, E.D., and L.R. Petzold. Functional network inference of the suprachiasmatic nucleus (2016) *PNAS*, 113 (16) pp. 4512-4517

St. John, P.C. and F.J. Doyle III. Quantifying stochastic noise in cultured circadian reporter cells (2015), *PLoS Computational Biology* 11(11): e1004451.

St. John, P.C., Taylor, S.R., Abel, J.H., and F.J. Doyle III. Amplitude metrics for cellular circadian bioluminescence reporters (2014) *Biophysical Journal*, 107 (11) pp. 2712-2722

St. John, P.C., Hirota, T., Kay, S.A. and F.J. Doyle III. Spatiotemporal separation of PER and CRY posttranslational regulation in the mammalian circadian clock (2014) *PNAS*, 111 (5) pp. 2040-2045.

St. John, P.C. and F.J. Doyle III. Estimating confidence intervals in predicted responses for oscillatory biological models (2013) *BMC Systems Biology* 7:71.

Hirota, T., Lee, J.W., **St. John, P.C.**, Sawa, M., Iwaisako, K., Noguchi, T., Pongsawakul, P.Y., Sonntag, T., Welsh, D.K., Brenner, D.A., Doyle, F.J. III, Schultz, P.G., Kay, S.A., Identification of small molecule activators of cryptochrome (2012) *Science*, 337 (6098) pp. 1094-1097.

Additional Information

Website: http://thedoylegroup.org/peter-st-john/
Google Scholar: https://scholar.google.com/citations?user=NdWzcVMAAAAJ
Github: https://github.com/pstjohn