

Dr. Michael Shaughnessy

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Keywords: AWS, Linux, Python, SQL

Experience

July 2016- **AppThis** *Technical Fellow / Machine Learning Team Lead*

Automate decision making for mobile ad transactions.

- Deployed an automated system to increase revenue and profit by 30%.
- Integrated machine learning across various aspects of the business.
- Built core prediction service handling 600M requests/day of highly variable volume, with 24-7 availability, sub 50 ms latency, and online training.
- Lead development of an RTB bidder system, with sub 15 ms latency and automated intelligent ad selection and bid pricing.

2015-2016 **Flourish Data Services** *Partner*

Machine learning consulting for ad-tech and IoT clients.

- Market simulations, reinforcement learning, differential privacy.

2014- 2015 **RTBiQ, Inc** *Data Scientist / Data Engineer*

Designed and implemented algorithms for pricing RTB advertising inventory.

- Deployed a predictive control system that lowered cost by up to 50%, identified fraud, and improved KPIs.

2013-2014 **Synopsys TCAD** *R&D Engineer*

Combined quantum models with commercial TCAD software.

- Enabled customers to simulate III-V semiconductors without experimental data.
- Set up a Linux-based distributed compute environment for multi-scale simulations. (C++, Bash and Python)
- Created Monte Carlo simulations for mole-fraction dependent transport in semiconductor alloys.

2011-2013 **Sandia National Labs** *Postdoctoral Researcher*

Supported national security and nuclear weapons reliability missions through machine learning, molecular dynamics, and electronic structure calculations. Initiated and won U.S. NRL funding for multi-year topological insulator research.

2009-2011 **Lawrence Livermore National Lab** *Lawrence Scholar*

Identified new magnetic alloys for permanent magnet and spintronic applications. Utilized terascale high-throughput compute clusters for multi-scale modeling.

2004-2011 **University of California, Davis:** *Research Assistant*

2003-2004 **Musculoskeletal Research Lab, Hershey:** *Student Researcher*

2002 **Cornell Controlled Environment Agriculture, Ithaca:** *Student Researcher*

2000-2004 **Cornell Physical Sciences Library, Ithaca:** *Library Manager*

Education

2011 PHD, Physics, University of California, Davis

Thesis: *Electronic and Magnetic Structure in Doped Semiconductors*

2004 BS, Agricultural and Biological Engineering, Cornell University

Patents

Differentially private processing and database storage (US 20170126694 A1)

Adaptive Parallelization for Multi-Scale Simulation (14/497681)

First Principles Design Automation Tool (PCT/US14/57803)

Estimation of Effective Channel Length for FinFETs and Nanowires (PCT/US14/57637)

Simulation Scaling with DFT and Non-DFT (14/498458)

Iterative Simulation with DFT and Non-DFT (14/498492)

Parameter Extraction of DFT (PCT/US14/57840)

Characterizing Target Material Properties Based on Properties of Similar Materials (14/497695)

Mapping Intermediate Material Properties to Target Properties to Screen Materials (PCT/US14/57707)

Publications

2008 J.Y. Lim, M. Shaughnessy, Z. Zhou, H. Noh, E. A. Vogler, and H. J. Donahue. Surface energy effects on osteoblast spatial growth and mineralization. *Biomaterials* **29**: 1776-1784

2009 M. Shaughnessy, C.Y. Fong, R. Snow, K. Liu, J. Pask, and L.H. Yang. Origin of Large Moments in $\text{Mn}_x\text{Si}_{1-x}$. *Appl. Phys. Lett.* **95**: 022515

- C. Y. Fong, M. Shaughnessy, R. Snow, Kai Liu, J. E. Pask, and L. H. Yang. Physical origin of measured magnetic moment in $\text{Mn}_x\text{Si}_{1-x}$ with $x = 0.1\%$. (invited) *Proceedings of SPIE*, **7398**: 73980J-1
- 2010 M. Shaughnessy, C.Y. Fong, L.H. Yang, Ryan Snow, X.S. Chen, and Z.M. Zhiang. Structural and magnetic properties of single dopants of Mn and Fe for Si-based spintronic materials. *Phys. Rev. B* **82**: 035202
- C. Y. Fong, M. Shaughnessy, R. Snow, and L. H. Yang. Theoretical investigations of defects in a Si-based digital ferromagnetic heterostructure - a spintronic material. *Physica Status Solidi C*, **7**: 747
- 2011 M. Shaughnessy, Ryan Snow, L. Damewood, and C. Y. Fong. Memory and Spin Injection Devices Involving Half Metals. *Journal of Nanomaterials*, **2011**: 140805
- 2012 S. Dag, M. Shaughnessy, C.Y. Fong, X.D. Zhu, L.H. Yang. First principles studies of a Xe atom adsorbed on NB(110) surface. *Physica B*, **407**: 2100
- C. Y. Fong, M. Shaughnessy, L. Damewood, and L. H. Yang. Theory, Experiment and Computation of Half Metals for Spintronics: Recent Progress in Si-based Materials. *Nanoscale Systems: Mathematical Modeling, Theory and Applications*, **1**: 1-22, 2012.
- 2013 M. Shaughnessy, C. Y. Fong, L. Damewood, C. Felser and L. H. Yang. Structural variants and the modified Slater-Pauling curve for transition-metal-based half-Heusler alloys. *Journal of Applied Physics*, **113**: 043709 (2013)
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- L.H. Yang, M. Shaughnessy, L. Damewood, C.Y. Fong. Half-metallic hole-doped Mn/Si trilayers. *Jour. of Phys. D.: Appl. Phys.*. (2013)
- 2014 M. Shaughnessy, J.D Sugar, N. Bartelt, J. Zimmerman. Energetics and thermodiffusion of Au in Bi_2Te_3 . *Journal of Applied Physics*.(2014)
- 2015 L. Damewood, B. Busemeyer, M. Shaughnessy, C.Y. Fong, L.H. Yang, C. Felser. Stabilizing and increasing the magnetic moment of half-metals: The role of Li in half-Heusler LiMnZ ($Z = \text{N, P, Si}$). *Physical Review B*. (2015)
- 2016 M. Shaughnessy and R. E. Jones, Efficient use of an adapting database of ab initio calculations to generate accurate Newtonian dynamics. *Journal of Chemical Theory and Computation*. (2016)

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