Dr. Michael Shaughnessy

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Keywords: AWS, Linux, Python, SQL

Experience

April 2019- **Exponential Interactive** *Technical Fellow*

• Deploy machine learning approach to automated decision making.

2016-2019 **AppThis (Acquired by Mundo Media Dec 2018)** *Machine Learning Team Lead*

Automate decision making for mobile ad transactions.
• Deployed a data-driven 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 intelligent ad selection and bid pricing.

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

Machine learning consulting for ad-tech and IoT clients.
• Market simulations and 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 Mn_xSi_{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 Mn_xSi_{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)

A.C. Ford, M. Shaughnessy, B.M. Wong, A. Kane, O.V. Kuznetsov, K.L. Krafcik, W.E. Billups, R.H. Hauge, F. Leonard. Physical Removal of Metallic Carbon Nanotubes from Nanotube Network Devices Using a Thermal and Fluidic Process. *Nanotechnology.* **24**: 105202. (2013)

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 LiMn Z (Z= 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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