

## Michael S. Gashler, Ph.D.

Neural Network and Machine Learning Research Scientist

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### RESEARCH FOCUS

I seek a position that will allow me to continue to pursue my research interests in neural networks and machine learning. In particular, I am interested in systems that can learn to perceive meaning embedded in high dimensional data such as digital images, sensor arrays, and documents. I feel that variations of deep neural network models that are suitable for operating in temporal settings have especially significant potential for enabling machines to assist with tasks that currently require human intelligence. My work falls in the proximity of deep neural networks, time-series prediction, non-linear dimensionality reduction, inference of intrinsic feature representations, black-box system identification, and cognitive architectures. Ultimately, I seek to enable machines to operate more autonomously with a greater diversity of problems, and I am interested in any challenge that will lead toward this end.

### AREAS OF EXPERTISE

- Published 7 peer reviewed journal articles
- 17 peer reviewed conference publications
- Deep Learning
- Nonlinear dimensionality reduction
- Time-series prediction
- Cognitive architectures
- Convolutional neural networks
- MCMC & Bayesian Inference
- Perception and inference of state
- Collaborative filtering
- Non-traditional architectures
- Wrote a textbook on machine learning.
- Taught AI, Machine Learning, Data Mining, and Programming for 6 years
- Experience from both academics and industry
- 7 years in leadership roles
- Developed an open source toolkit of machine learning algorithms. Includes tools for classification, regression, collaborative filtering, non-linear dimensionality reduction, clustering, Bayesian graphical models, ensemble methods, data visualization, sparse matrix processing, optimization, reinforcement learning, and deep neural network learning. (See <https://github.com/mikegashler/>)
- Several other open source projects
- 25+ years of programming experience (C++, Java, C#, PHP, Javascript, Assembly, Python, and several others)
- Debugging expertise from assisting hundreds of students to debug horribly-designed code.

My full CV is available at: <http://gashler.com/mike/cv/cv.pdf>

My Google Scholar profile: <https://scholar.google.com/citations?user=nlZtV-8AAAAJ>

### EDUCATION

**Ph.D.** in Computer Science, 2012.

[Advancing the effectiveness of nonlinear dimensionality reduction techniques](#)

Brigham Young University, Provo, UT 84602

Advisor: Tony Martinez

**M.S.** in Computer Science, 2007.

[Manifold Sculpting](#)

Brigham Young University, Provo, UT 84602

**B.S.** in Computer Science, 2001,

Brigham Young University, Provo, UT 84602

## EMPLOYMENT HISTORY

|                |  |   |
|----------------|--|---|
| 2019 – Present | SupplyPike                               | Research Scientist. Invented new products that use AI to solve problems related to supply chains.   |
| 2012 – 2018    | University of Arkansas                   | Assistant Professor in the Department of Computer Science and Computer Engineering.   |
| 2006 – 2012    | Neural Networks and Machine Learning Lab | Research Assistant for Dr. Tony Martinez in machine learning at Brigham Young University.   |
| 2004 – 2006    | Edometrics Institute                     | Worked as a development lead and engineer to build an interpreter training program and a decentralized multi-player Internet game.          |
| 2001 – 2004    | Microsoft                                | Worked for Microsoft on the Common Language Runtime (the .NET virtual machine.) I developed Code Access Security, and the PE file Verifier. |

## A FEW SELECTED JOURNAL ARTICLES

- Pierson, Harry A. and Gashler, Michael S. "[Deep Learning in Robotics: A Review of Recent Research.](#)" **Advanced Robotics** 31, no.16, 821-835. Taylor & Francis. 2017.
- Godfrey, Luke B. and Gashler, Michael S. [Neural Decomposition of Time-Series Data for Effective Generalization.](#) **IEEE Transactions on Neural Networks and Learning Systems**, 2017.
- Gashler, Michael S. and Stephen C. Ashmore. "[Modeling time series data with deep Fourier neural networks.](#)" **Neurocomputing** 188: p. 3-11. May 2016.
- Gashler, Michael S. [Waffles: A machine learning toolkit.](#) **Journal of Machine Learning Research**, 12:2383–2387, July 2011. ISSN 1532–4435.

## A FEW SELECTED CONFERENCE PUBLICATIONS

- Joshua R. Smith and Michael S. Gashler. "[An Investigation of How Neural Networks Learn From the Experiences of Peers Through Periodic Weight Averaging.](#)" 16th **IEEE International Conference on Machine Learning and Applications (ICMLA)**, Dec., 2017, Cancun, Mexico.
- Ashmore, Stephen C. and Gashler, Michael S. [A Method for Finding Similarity between Multi-Layer Perceptrons by Forward Bipartite Alignment.](#) In Proceedings of the **IEEE International Joint Conference on Neural Networks IJCNN'15**. IEEE Press, Killarney, Ireland, July, 2015.
- Gashler, Michael S. and Ventura, Dan and Martinez, Tony. [Iterative non-linear dimensionality reduction with manifold sculpting.](#) In Platt, J.C. and Koller, D. and Singer, Y. and Roweis, S., editor, **Advances in Neural Information Processing Systems 20**, pages 513–520, MIT Press, Cambridge, MA, Vancouver, B.C., 2008.

## PATENTS

- Lange, Sebastian and Fee, Gregory D and Goldfeder, Aaron and Medvedev, Ivan and Gashler, Michael. *Security requirement determination*. June 2010. US Patent 7,743,423.
- Brumme, Christopher W and Lange, Sebastian and Fee, Gregory D and Gashler, Michael. *Hosted code runtime protection*. Jan 2010. US Patent 7,647,629.