Alex Duda

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Summary

I have led research and development projects for novel machine learning capabilities in industries including cybersecurity, space, electronics, defense, and music. I am open to growing into roles involving all phases of the machine learning model lifecycle. I am eager to contribute as a hands-on builder, subject matter expert, tech lead, principal investigator, strategist, mentor, and in other ways as well. I am particularly interested in developing decentralized democratized tech that helps the individual pursue independence, agency, self-determination, enhancement, and a meaningful, good life.

Education

University of Illinois at Urbana-Champaign (UIUC)

2015 **PhD, Electrical and Computer Engineering**, Signal Processing and Machine Learning

2009 **MS, Applied Mathematics**, Optimization and Algorithms

2006 **BS, Engineering Physics**

Selected Experience

Independent Researcher

2024-06 – present **Various** ○ **Remote**

Developing advanced concepts for:

1. Generative AI in custom music, cognitive warfare, etc.
2. Neuromorphic ML in low-SWAP edge sensing, processing, actuating, etc.
3. Agentic AI for at-scale trend identification, tracking, analysis, etc.
4. Enhancing human capability via AI-enabled collaboration among humans and machines

Director of Machine Learning

2023-03 – 2024-06 **Songfinch, Chicago, IL** ○ **Remote**

1. Joined Series A venture-backed startup which in 2023 was the fastest-growing consumer product company in USA (but had no ML capabilities)
2. Hired to lead ML initiatives across company which included working with executive leadership to identify opportunities, articulating strategy, designing capabilities, building an ML team, and collaborating with cross-functional teams throughout ML model lifecycle
3. Prioritized ML capabilities that enabled new forms of creative collaboration between humans, as well as musical ability enhancement
4. Worked with Artist Innovation Team to help define vocal model templates to drive data collection
5. Worked with UX Design Team and UX Engineering Team to create data collection application for artists and customers
6. Developed audio capabilities related to singing voice conversion (svc), monophonic instrument conversion (mic), and singing voice synthesis (svs)
7. Leveraged transformer-based models to encode voices via self-supervised learning
8. Pre-trained base models from scratch on custom curated artist vocal data to enable transfer learning
9. Fine-tuned base models on customer vocal data
10. Defined specific product features leveraging a novel generative AI vocal audio music capability
11. Optimized svc training to require $\approx 15x$ less training data and $\approx 150x$ less training epochs (when compared to state-of-the-art in literature review)
12. Achieved robust, compelling (natural, smooth, beautiful), svc performance across a wide variety of source/target voices, songs, and musical styles
13. Collaborated closely with Infrastructure Team to mature prototype into containerized capability that could be orchestrated at-scale via Kubernetes within cloud computing platform

Staff Artificial Intelligence Engineer Software T05

2022-09 – 2023-03 **Northrop Grumman Mission Systems, Baltimore, MD ○ Remote**

1. Led research and development of computer vision neuromorphic machine learning for tracking and anomaly detection on DARPA program focused on event-based asynchronous neuromorphic IR sensor
2. Led machine learning thrust for External Tech Lab within CTO Office's Disruptive Concepts and Technologies Division
3. Led team for research and development of on-chip, few-shot, reconfiguration, and cooperative distributed machine learning capability

Future Technical Leaders Program Alumni Recruiter at UIUC

2016-08 – 2023-03 **Northrop Grumman Corporation, Falls Church, VA ○ Remote**

1. Led recruiting from 2019 to 2023
2. Assisted recruiting from 2016 to 2018
3. Established and nurtured relationships with contacts across university
4. Marketed, presented, coordinated team for information sessions
5. Interviewed, evaluated, selected high potential (graduate degree and post-doc) candidates
6. Presented candidates to program office decision committees
7. Provided ongoing guidance to candidates
8. Presented detailed recruiting retrospective to help improve process

Senior Principal Artificial Intelligence Engineer Software T04

2021-01 – 2022-09 **Northrop Grumman Mission Systems, Baltimore, MD ○ Remote**

1. Led research and development of computer vision neuromorphic machine learning for tracking and anomaly detection on DARPA program focused on event-based asynchronous neuromorphic IR sensor
2. Led machine learning thrust for External Tech Lab within CTO Office's Disruptive Concepts and Technologies Division
3. Led team for research and development of computer vision object detection via on-chip few-shot machine learning capability
4. Served as subject matter expert for tech trend study on explainable AI and interpretable AI

Senior Principal Research and Development Engineer Scientist T04

2017-06 – 2020-12 **Northrop Grumman Mission Systems, Baltimore, MD ○ Hybrid**

1. Led team for research and development of synthetic data generator to improve deep artificial neural network object detection for challenging environments
2. Served as subject matter expert for applications of spiking neural networks on superconducting neuromorphic systems, machine learning applications projects, capture, and proposals
3. Served as subject matter expert on neuromorphic machine learning for winning DARPA proposal
4. Completed study of future hardware accelerators of machine learning applications
5. Led small team for research and development of smart sensor resource management capability

Principal FTL Systems Engineer T03

2016-08 – 2017-06 **Northrop Grumman Electronic Systems, Linthicum, MD ○ On-Site**

1. Completed third FTL rotation in Advanced Concepts & Technologies Division
2. Primarily supported shaping, capture, proposal, on multiple DARPA efforts
3. Technical areas focused on next-generation machine learning, stochastic computing, cognitive frameworks, and context-sensitive adaptive edge perception/computation/control
4. Served as subject matter expert on cognitive systems for winning DARPA proposal

2015-07 – 2016-07 **Northrop Grumman Aerospace Systems, Space Park, CA ○ On-Site**

1. Completed second FTL rotation in *NG/Next* Basic Research supporting the Biologically-Inspired Processing and Sensing (BIPS) group
2. Contributed to founding whitepaper for BIPS group
3. Provided tours/demos for *NG/Next* Lab to various NGC personnel, across a wide range of backgrounds including corporate directors, engineers, executives, and R&D managers

4. Led team for research and development of collision avoidance for neurorobot with unsupervised online machine learning using spiking neural networks
5. Supported proposal and topic area at Telluride Neuromorphic Cognition Engineering Workshop
6. Represented *NG/Next* BIPS group at Design & Emergent Systems Sidebar at *NGC* TechExpo

2014-09 – 2015-07 **Northrop Grumman Information Systems, Annapolis Junction, MD ○ On-Site**

1. Completed first FTL rotation in Cyber Division
2. Led tech strategy research on potentially disruptive low-TRL hardware trends for big data processing systems, particularly focused on accelerating machine learning applications
3. Led state-of-the-art trade study on streaming and in-memory engines
4. Attended and documented *2014 IEEE Big Data Conference* **URI**, *2015 Solid Conference (HW, SW, and IoT)* **URI**, and *2015 In-Memory Computing Summit* **URI**
5. Provided technical writing support and innovation ideas for business proposal tech volume

Graduate Researcher

2011 – 2014 **Beckman Institute for Advanced Science and Technology**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Led research and development project for unsupervised online machine learning using spiking neural networks for multi-sensory data
2. Worked on Sandia National Labs funded *Computational Models of Neural Population Dynamics*
3. Designed canonical cellular-resolution spiking neural network
4. Incorporated adaptive synapses with plasticity and stochastic transmission
5. Empirically studied extent to which summary statistics were information-preserving
6. Explored techniques to establish similarity measures between phase portraits
7. Used emergent dynamics of spiking neural networks for multi-sensory associative memory
8. Examined methods of processing high-throughput data with finite resources
9. Employed visualization techniques for high-dimensional systems

2012-05 – 2012-08 **Computer Science Research Institute**

Sandia National Laboratories, Albuquerque, NM ○ On-Site

1. Completed internship focused on PhD dissertation work
2. Identified important features in conductance-based adaptation-enabled synapse model
3. Adapted spike-timing dependent plasticity (STDP) model for online synaptic weight learning
4. Crafted stochastic transmission model to modulate synaptic learning
5. Designed, simulated, tuned, and debugged NeuroXyce synapse device **PDF**
6. Cited by Qualcomm (Jason Frank Hunzinger and Thomas Zheng) in U.S. Patents *9,015,096* **URI** and *9,208,431* **URI**
7. Cited by DNNresearch and Google (Geoffrey E. Hinton, Alexander Krizhevsky, Ilya Sutskever, and Nitish Srivastva) in U.S. Patents on *Dropout* and *DropConnect* (among other topics) as detailed in *9,406,017* **URI**, *10,366,329* **URI**, *10,977,557* **URI**, and *11,829,882* **URI**

2010 – 2011 **Beckman Institute for Advanced Science and Technology**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Worked on Navy Research Lab funded *The Role of Sensorimotor Function, Associative Memory, and Reinforcement Learning in Automatic Acquisition of Spoken Language by an Autonomous Robot*
2. Conducted scholarly research on use of spiking neural networks for sensory integration
3. Determined minimal required features of canonical cellular-resolution spiking neural network
4. Explored ways to use dynamics of spiking neural networks as basis for associative memory

2010-06 – 2010-06 **New England Complex Systems Institute (NECSI) Summer School**

Massachusetts Institute of Technology (MIT), Cambridge, MA ○ On-Site

1. Completed CX 201 - Complex Physics, Biological, and Social Systems

2. Completed CX 102 - Computer Programming and Complex Systems
3. Completed CX 202 - Complex Systems Modeling and Networks
4. Created exploratory computational project on the Kuramoto Model for synchronization behavior of coupled oscillators ▶ WMV

2010-01 – 2010-08 **Beckman Institute for Advanced Science and Technology**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Worked on Sandia National Labs funded *Mathematical Models of Neocortical Circuits*
2. Numerically integrated Hodgkin-Huxley spiking neuron model; explored variety of nonlinear behaviors
3. Investigated statistical methods to create reduced-order models of spiking neural networks
4. Implemented small-scale spiking neural network (25+ neurons, 120+ synapses)

2009-01 – 2010-01 **Beckman Institute for Advanced Science and Technology**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Investigated recurrent artificial neural networks for associative learning
2. Analyzed state transition dynamics and emergence of basins of attraction
3. Explored attractor topology
4. Compared behavior to that predicted by presence of feedback cycles (number, type)

2007-08 – 2008-08 **Siebel Center for Computer Science**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Investigated variants of Kauffman's NK model
2. Reviewed analytical and simulation results
3. Simulated deterministic and stochastic variants
4. Analyzed N, K value impact on fitness landscape
5. Evaluated effectiveness of different search algorithms to approach optima

2007-08 – 2007-12 **Siebel Center for Computer Science**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Completed project on optimal path planning through probabilistic digraph
2. Investigated analytical and computational approaches
3. Compared shortest path algorithms

Undergraduate Researcher

2006-05 – 2006-08 **Loomis Laboratory of Physics**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Completed experimental biophysics project
2. Prepared DNA samples for use in single-molecule optical experiments
3. Applied specialized optical techniques, such as FIONA (Fluorescence Imaging with One-Nanometer Accuracy), to study DNA molecules
4. Developed program for tracking microtubules that enabled automated analysis of collected frame-data and increased precision in molecular dynamics studies

2005-08 – 2005-12 **Loomis Laboratory of Physics**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Completed computational biophysics project
2. Programmed simulations of enzymes using Tcl scripting language
3. Generated simulation visualizations using VMD (Visual Molecular Dynamics) software
4. Examined thermodynamic behavior of enzymes during equilibration
5. Prepared statistical analysis of enzyme's behavior during simulation

2005-01 – 2005-05 **Altgeld Hall**

University of Illinois at Urbana-Champaign, Urbana, IL ○ On-Site

1. Completed applied linear algebra project
2. Investigated information retrieval, population migration, and computer graphics
3. Determined coding matrices using Mathematica

Selected Publications

Spiking Neural Networks

[7] P. Tschirhart, A. Duda, and K. Segall, "Architecture Considerations for Superconducting Neuromorphic Systems: Programmability, Scalability, Area, and Latency", 2020 29th Applied Superconductivity Conference (Special Session on Novel Computing – Reversible and Neuromorphic), 2020, pp. 1 - 21.

[6] A. Duda, "Towards a Neocortically-Inspired Ab Initio Cellular Model of Associative Memory", PhD dissertation, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, 2015. URI

[5] A. M. Duda and S. E. Levinson, "Information-Preserving Transforms: Two Graph Metrics for Simulated Spiking Neural Networks", Procedia Computer Science, vol. 20, 2013, pp. 14 - 21. URI

[4] A. M. Duda and S. E. Levinson, "Complex Networks of Spiking Neurons: Collective Behavior Characterization", 2011 Eighth International Conference on Complex Systems, Quincy, MA, 2011, pp. 1627 - 1629, (Best Poster Award Winner). URI

[3] A. M. Duda and S. E. Levinson, "Characterizing Populations of Spiking Neurons", 2011 Fifteenth International Conference on Cognitive and Neural Systems, Boston, MA, 2011, pp. 87.

[2] A. M. Duda and S. E. Levinson, "Nonlinear Dynamical Multi-Scale Model of Associative Memory", 2010 Ninth International Conference on Machine Learning and Applications, Washington, DC, 2010, pp. 867 - 872, (Best Poster Award Nominee). URI

[1] L. Majure, L. Niehaus, A. Duda, A. Silver, L. Wendt, and S. Levinson, "Integrating Language and Motor Function on a Humanoid Robot", 2010 Twenty Third IEEE/RSJ International Conference on Intelligent Robots and Systems, RobotCub Workshop, 2010, pp. 1 - 5. URI

Selected Tech Reports

Machine Learning

[3] A. Duda, "Some Brief Notes on Ensemble Methods: AdaBoost, Random Forest, and Gradient Boosting", Tech. Rep., 2020, p. 1 - 6. PDF

[2] A. Duda, "Ensemble Methods for High Dimensional Data: Primary Considerations for a Principled, Advanced, Approach", NGMS, Baltimore, MD, Tech. Rep., 2019, pp. 1 - 4.

[1] A. Duda, "DARPA SAGA - Recommendations and Insights", NGES, Linthicum, MD, Tech. Rep., 2017, pp. 1 - 7.

Natural Language Processing

[3] A. Duda, "HMM as Building Block in Models of Brain, Language, and Mind", Beckman Institute, Urbana, IL, Tech. Rep., 2013, pp. 1 - 6. PDF

[2] A. Duda, "The Importance of Being Parsed", Beckman Institute, Urbana, IL, Tech. Rep., 2013, pp. 1 - 14. PDF

[1] A. Duda, "Symbols ⇔ Models", Beckman Institute, Urbana, IL, Tech. Rep., 2013, pp. 1 - 45. PDF

Neural Cognitive Machine Intelligence

[3] A. Duda, "From Natural Intelligence to Machine Intelligence: Augmented Cattell-Horn-Carroll (CHC) Theory of Cognitive Abilities as Framework for Progress", NGMS, Baltimore, MD, Tech. Rep., 2019, pp. 1 - 12.

[2] A. Duda, "Towards A More Natural Machine Intelligence: For Those Looking to Enhance Machines with Neuroscience", NGMS, Baltimore, MD, Tech. Rep., 2019, pp. 1 - 22.

[1] A. Cobb, A. Duda, S. Kelly, J. Shepanski, and G. Tseng, "Biologically Inspired Processing and Sensing (BIPS) Group Founding Whitepaper ", NGAS, Space Park, CA, Tech. Rep., 2015, pp. 1 - 75.

Next-Generation Hardware for Big Data Processing, Machine Intelligence, etc.

[3] A. Duda, "Towards a Streaming Analytics Platform: Hardware Considerations, Predictions, and Recommendations", NGIS, Annapolis Junction, MD, Tech. Rep., 2015, pp. 1 - 23.

[2] A. Duda, "Memristors in Big Data", NGIS, Annapolis Junction, MD, Tech. Rep., 2015, pp. 1 – 35.

[1] A. Duda, "Important Opportunities for M2M/IoT in 2020", NGIS, Annapolis Junction, MD, Tech. Rep., 2014, pp. 1 - 3.

Sensor Resource Management

[3] A. Duda, "SRM Technology Readiness Demo Assessment and Recommendations", NGMS, Baltimore, MD, Tech. Rep., 2018, pp. 1 - 6.

[2] A. Duda and C. Lefler, "Interest-Level Assessor: A Holistic, Contextual, Approach", NGMS, Baltimore, MD, Tech. Rep., 2018, pp. 1 - 18.

[1] A. Duda and C. Lefler, "Command Selection for Real Benefit: Short Time-Horizon Capability Command Down-Selector", NGMS, Baltimore, MD, Tech. Rep., 2018, pp. 1 - 12.

Signal Processing

[1] A. Duda, "Over the channel and through the noise: A Study in Adaptive Filter Design with DFE", Beckman Institute, Urbana, IL, Tech. Rep., 2011, pp. 1 - 6. **PDF**

Spiking Neural Networks

[6] A. Duda, "Embodied Adaptive Spiking Neural Networks: Emergent Weighted Directed Graph Structure and its Applicability to Novelty Detection", NGAS, Space Park, CA, Tech. Rep., 2016, pp. 1 - 34.

[5] A. Duda, "Desirable Features of a Neocortically-Inspired Ab Initio Model of Associative Memory", Beckman Institute, Urbana, IL, Tech. Rep., 2012, pp. 1 - 86. **PDF**

[4] A. Duda, "NeuroXyce Synapse Device with STDP and Stochastic Transmission Reliability", Beckman Institute, Urbana, IL, Tech. Rep., 2012, pp. 1 - 11, (Cited by Qualcomm, DNNresearch, and Google (*Dropout*, *DropConnect*, etc.)). **PDF**

[3] R. Schiek, C. Warrender, C. Teeter, J. Aimone, H. Thornquist, T. Mei, and A. Duda, "Simulating neural systems with Xyce", Sandia National Laboratories, Albuquerque, NM, Tech. Rep., 2012, pp. 1 - 78. **PDF**

[2] A. Duda, "Multimodal Memory Encoding with Large Populations of Spiking Neurons", Beckman Institute, Urbana, IL, Tech. Rep., 2010, pp. 1 - 76. **PDF**

[1] A. Duda, "Simulink Implementation of Hodgkin-Huxley Spiking Neuron Model", Beckman Institute, Urbana, IL, Tech. Rep., 2010, pp. 1 - 15. **PDF**

Synthetic Data Generation

[1] A. Duda, "Synthetic Data Generator (sdg) for Improved Deep Learning Based Object Detectors", NGMS, Baltimore, MD, Tech. Rep., 2020, pp. 1 - 10.

Selected Presentations

2019-04-11 Towards A More Natural Machine Intelligence: For Those Looking to Enhance Machines with Neuroscience, NGMS, Linthicum, MD

2016-07-14 *NG/Next* BIPS Group Demo, Telluride Neuromorphic Cognition Engr. Workshop, Telluride, CO

2016-06-24 *NG/Next* All Minds Meeting, NGAS, Manhattan Beach, CA

2016-06-{7,8} *NG/Next* Basic Research BIPS group Demo/Talk, NGC TechExpo, McLean, VA

201-03-21 Embodied Adaptive Spiking Neural Networks: Emergent Weighted Directed Graph Structure and its Applicability to Novelty Detection, *NG/Next* Basic Research Series, Redondo Beach, CA

2016-03-10 MUNDANE: Multisensory Adaptive Data Experience Technology, NGC FTL/SEA Spring Learning Forum, Baltimore, MD

2015-06-16 Memristors in Big Data, NGIS Cyber Division Operations Webinar Series, AJ, MD

2015-06-{9,10} NGC IR&D Big Data 2020 Demo/Talk, NGC TechExpo, McLean, VA

2015-04-23 Towards a Streaming Analytics Platform: Hardware Focus, NGIS, AJ, MD

2015-02-20 IEEE Big Data Conference 2014 Overview, NGIS Cyber Analytics & Research Department Webinar Series, AJ, MD

2014-09-05	PhD Final Examination, Urbana, IL
2013-12-02	Unsupervised Machine Learning with Spiking Neural Networks, MIT Lincoln Lab, Lexington, MA
2013-11-21	Graduate School Advice Talk, HKN ECE Honor Society, Urbana, IL
2013-11-13	Information-Preserving Transforms: Two Graph Metrics for Simulated Spiking Neural Networks, Complex Adaptive Systems Conference, Baltimore, MD
2013-03-08	Language Acquisition and Robotics Group Demo/Talk, Beckman Institute Open House, Urbana, IL
2013-03-07	PhD Preliminary Examination, Urbana, IL
2012-02-09	Desirable Features of a Neocortically-Inspired Ab Initio Model of Associative Memory, Language Acquisition and Robotics Group Research Meeting, Beckman Institute, Urbana, IL
2011-06-30	Complex Networks of Spiking Neurons: Collective Behavior Characterization, International Conference on Complex Systems, Boston, MA
2011-05-14	Characterizing Populations of Spiking Neurons, International Conference on Cognitive and Neural Systems, Boston, MA
2011-03-11	Language Acquisition and Robotics Group Demo/Talk, Beckman Institute Open House, Urbana, IL
2010-12-12	Nonlinear Dynamical Multi-Scale Model of Associative Memory, International Conference on Machine Learning and Applications, Washington DC
2010-11-18	Neuroengineering IGERT @ Illinois Seminar Series, Urbana, IL
2010-10-13	Beckman Graduate Student Seminar, Urbana, IL
2010-06-24	Nonlinear Dynamical Models of Associative Memory, Computer Science Research Institute Seminar at Sandia, Albuquerque, NM
2010-06-18	Computational Explorations of the Kuramoto Model, New England Complex Systems Institute Summer School at MIT, Cambridge, MA

Selected Software Skills

OS	Linux, macOS, Windows
Cloud	AWS Elastic Compute Cloud (EC2), Amazon Machine Images (AMI), Amazon SageMaker
Documents	Inkscape, LaTeX, LibreOffice, Microsoft Office, Open Office, TeXstudio
Edit	Jupyter Notebook, Visual Studio Code
Languages	Python, MATLAB, C, C++, Mathematica, Tcl
Sense	Java tool for Address-Event Representation (jAER), ROS
Simulate	NeuroXyce, Simulink, STELLA
Python Packages	argparse, Augmentor, basic-pitch, csv, datetime, glob, json, keras, librosa, logging, math, matplotlib, multiprocessing, NetworkX, numpy, operator, os, pandas, pickle, pillow (PIL), PyTorch, pytorch-lightning, random, re, scikit-learn, seaborn, string, sys, tensorflow, tensorflow_datasets, tensorflow_hub, time, torch, torchvision, warnings
Audio	Audacity, LMMS, Pro Tools, Reason, Synthesizer V Studio, VCV Rack

Selected Interests

Science, Math	cognitive systems, complex systems, computational systems neuroscience, creativity, networks, nonlinear dynamics, sensor resource management, signal processing, swarms, systems science
Engineering, Tech	{biological, cognitive, heuristic, neural}-inspired computing, cognitive robotics, computational intelligence, data science, developmental embodied systems, event-based asynchronous spatio-temporal {processing, sensing}, human-machine {integration, interaction}, machine {creativity, curiosity, emotion, imagination, improvisation, originality, play}, neuromorphics, neurorobotics, reinforcement learning, soft computing, swarm intelligence
Machine Learning	adversarial/secure machine learning, ensemble methods, event-based asynchronous spatio-temporal algorithms, explainable AI, few-shot learning, generative AI, interpretable AI, natural language processing, on-chip in-field learning, reinforcement learning, self-supervised learning, supervised learning, synthetic data generation, unsupervised learning
Neural Networks	artificial neural networks, convolutional neural networks, deep artificial neural networks, deep learning, generative adversarial networks, large language models, recurrent neural networks, spiking neural networks, transformers
Organizational	{developing, nurturing} collaborative, creative, ecosystems

Awards and Honors

2020 – 2021 Artificial Intelligence Advanced Academy (AIAA) at Northrop Grumman Corporation
2017 – 2018 Mentoring the Technical Professional (MTP) Program at Northrop Grumman Corporation
2014 – 2017 Future Technical Leaders (FTL) Program at Northrop Grumman Corporation
2013 F – Eta Kappa Nu (HKN) Electrical and Computer Engineering Honor Society, Alpha Chapter
2011 Su International Conference on Complex Systems Best Poster Award Winner
2010 W IEEE International Conference on Machine Learning and Applications Best Poster Award Nominee
2009 F, 2010 F List of Teachers Ranked as Excellent by their Students
2010 Su New England Complex Systems Institute Summer School Scholarship Recipient

Leadership Miscellaneous

Mentor

2014 – 2023 Twenty five engineers/scientists/technologists with a variety of backgrounds and experience-levels
2013-01 – 2013-08 UIUC CS Senior Thesis: *Controlling an Autonomous Car with a Spiking Neural Network*
2010-08 – 2011-05 UIUC ECE Senior Thesis: *Analysis of an AB Initio Multi-Scale Model of Associative Memory* URI

Founder

2021-03 – 2023-08 Big Ideas Meeting (Monthly); members from academia, industry, and national labs
2019 – 2022 FTL/UIUC Meeting (Quarterly)
2016 Su *NG/Next* All Minds Meeting
2015-01 – 2016-01 Cyber Analytics & Research Department Webinar Series at NG (Monthly)
2013-05 – 2014-12 Big Ideas Meeting at UIUC (Weekly); members from across fields

Reviewer

2014, 2015 Complex Adaptive Systems Conference, Procedia Computer Science

Memberships

2013 – IEEE {Computational Intelligence; Information Theory; Signal Processing} Society

Teaching Experience

2013 F, 2014 S **Teaching Assistant**, ECE 110 Lab: Introduction to ECE
2013 S **Teaching Assistant**, ECE 101: Exploring Digital Information Technology
2009 F, 2010 F **Teaching Assistant**, COE/LAS Honors Calculus II Project
2008 F **Teaching Assistant**, Introductory Control Systems Lab
2006 – 2008 **Tutor**, Department of Mathematics
2005 – 2007 **Tutor**, Department of Physics