



IanGemp

PhD Candidate | UMass Amherst

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Programming

Recent:

Python • Theano
Tensorflow • MXNet

Past 5 Years:

Matlab • Typescript
Go • SQL • VBA

Coursework

Computer Science

Machine Learning
Artificial Intelligence
Graphical Models
Deep Learning
Interactive Learning
Optimization

Approx & Comb Opt
Algorithms

Applied Math (ODEs/PDEs)

Numerical, Analytical,
Asymp. Perturbation
Dynamical Systems
Optimal Control

Education

2013 - 2018	PhD in Computer Science	University of Massachusetts, Amherst MA
2013 - 2016	MS in Computer Science	University of Massachusetts, Amherst MA
2010 - 2011	MS in Applied Mathematics	Northwestern University, Evanston IL
2006 - 2010	Dual BS in Applied Mathematics and Mechanical Engineering	Northwestern University, Evanston IL

Relevant Experience

09/13 - Now	Research Assistant	UMass CICS - Autonomous Learning Lab
	Conduct research with <i>Professor Mahadevan</i> on optimization, equilibration, multi-agent learning, reinforcement learning, deep learning, and modeling.	
	<ul style="list-style-type: none"> Identify and characterize equilibria in non-monotone variational inequality games (with applicability to GANs). [Master's Thesis] Design a novel semi-supervised VAE for the unmixing of spectral data transmitted from the Curiosity rover and satellites on Mars. [NIPS AABI '17] Develop a learning model for context dependent cognition inspired by the path integral formulation of quantum mechanics. 	
05/18-08/18	Applied Scientist Intern	Amazon Web Services—AI Algorithms (Sagemaker)
	Automate the discovery of user desired topics with advanced deep learning techniques. Mentored by Bing Xiang, Ramesh Nallapati, and Ran Ding.	
	<ul style="list-style-type: none"> Designed a semi-supervised Neural Topic Model (NTM) that can align to user desired topics given weak supervision. 	
09/17 - 12/17	Teaching Instructor	UMass Undergraduate Artificial Intelligence Course (CS383)
	Teach 105 undergrads AI —Text: <i>Russell & Norvig</i> .	
	<ul style="list-style-type: none"> Prepared 25 lectures with slides, 6 homeworks, 1 midterm, and 1 final exam. Instructed students twice weekly in 1 hr 15 min class + office hours. Delegated duties to 2 TA's and 2 undergraduate graders. 	
06/16-02/17	PhD Data Scientist Intern	Adobe Research (Big Data Experience Lab)
	Automate data cleansing through meta-learning and metric learning under guidance of Georgios Theocharous and Mohammad Ghavamzadeh.	
	<ul style="list-style-type: none"> Designed a system that intelligently recommends effective data cleansing procedures for new machine learning tasks. Oral @ IAAI'17—"Automated Data Cleansing through Meta-Learning". 	
Spr 15 & 16	Teaching Assistant	UMass Graduate Machine Learning Course (CS589)
	Assist <i>Professor Marlin</i> in teaching graduate level Machine Learning.	
	<ul style="list-style-type: none"> Prepared and graded assignments for regression, classification, and unsupervised tasks performed on UCI and other datasets. Assisted students in understanding course content and assignments during weekly office hours. 	
06/15 - 09/15	Program Assistant	UMass Research Experience for Undergrads (REU)
	Facilitate the progress and development of 17 undergrads through a summer research training program in data science.	
	<ul style="list-style-type: none"> Helped teach standard data science practices for Data Science Bootcamp. Invited and scheduled speakers for weekly lunch seminars. 	

Talks

PSIDA (04/18)

IAAI (02/17)

SciX (09/16)

AAAI Spring

Symposium (03/15)

AAAI Computational

Sustainability

Workshop (01/15)

AAAI Fall Symposium

(11/14)

UMass Machine

Learning & Friends

(09/14)

09/07 - 06/10 Research Assistant

NU Research Training Group

Tackle problems in the life sciences as part of Northwestern University's interdisciplinary, NSF-funded *Research Training Group*.

- Derived morphological models for the fruit fly ocular cell structure based on minimizing surface energy functionals.
- Simulations of both wild type and mutant structures with Surface Evolver validated “recycling” model over “destruction” model.

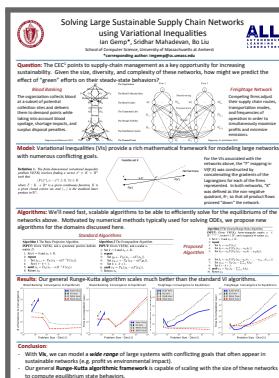
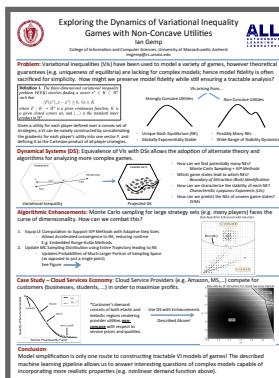
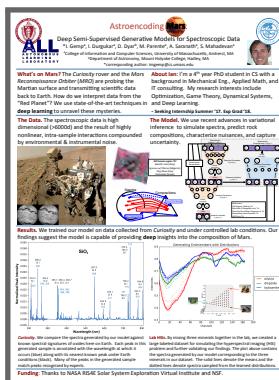
Sum 08 & 09 Research Assistant

University of Texas Medical Center

Perform experiments, construct simulations and assist doctoral and post-doctoral students in the lab of *Professor Heidelberger*.

- Collected Ca^{2+} potentials of neurons in vitro under microscope. Automated data analysis with IgorPro procedures (2008).
- Implemented Monte Carlo Markov Chains in Matlab to simulate vesicle release of neurotransmitters in goldfish retinal neurons (2009).

Posters



Work Experience

08/11 - 07/13 Project Management Consultant

Capgemini US LLC

Manage various phases of the software development life cycle through project tracking, reporting, and planning as a staff consultant in Capgemini's Enterprise Architecture & Integration Services Line.

- Traveled weekly to work with a variety of clients around the U.S.
- Tracked and advised a nationwide software+hardware installation schedule according to resource and time constraints.
- Designed an Access database driven excel report with VBA.
- Facilitated meetings, managed staff resources, organized project tracking, and assisted in testing for mobile and web apps.
- Trained in software development processes, rapid design and visualization, and programming languages during an extended onboarding in Mumbai, India.

08/10 - 12/10 Office Assistant

Cardiomedix

Handle collection of revenue from cardiac monitor sales.

- Managed Medisoft billing tasks including filing insurance claims/appeals, sending patient statements, and posting deposits.
- Mediated between patients, doctors, and nurses to maintain a smooth flow of communication and customer satisfaction.
- Functioned as an office consultant for complex billing issues despite minimal training in an understaffed billing department.

Honors & Leadership Roles

2017 UMass CS Graduate Student Representative

2014 - Now UMass CS Social Committee Member

2015 Fall Intramural CS Flag Football & Volleyball Captain

2013 Awarded 1 of 10 Royal E. Cabell Fellowships to NU's PhD program

2010 Inducted into National Honorary Fraternity for ME (Pi Tau Sigma)

Places Lived

Houston, TX
Chicago, IL
Amherst, MA
Northampton, MA

Places Traveled



Course Projects

- 11/15 - 12/15 **Deep Learning with Runge-Kutta** UMass Deep Learning
Compared various embedded Runge-Kutta (RK) methods against Adagrad and Nesterov with momentum.
- 11/14 - 12/14 **WeTube** UMass Systems
Designed a P2P system in Go for watching YouTube videos synchronously across machines.
- 09/14 - 10/14 **Browser Python Interpreter** UMass Systems
Wrote a Typescript program for parsing and executing Python bytecode in the browser. [Team Project]
- 01/14 - 05/14 **Roger the Crab** UMass Robotics
Employed a combination of PD controllers, Kalman filters, FSMs, and stereo triangulation to equip a virtual ping-pong playing bot in C++.
- 11/13 - 12/13 **Draft Day Catastrophe** UMass Machine Learning
Populated missing NFL combine data using several ML algorithms including a novel application of manifold alignment to data boosting. [Team Project]
- 04/10 - 06/10 **Gear Box Design** NU Theory of Machines
Wrote Matlab code to minimize gear forces and volume under size, velocity ratio, and durability constraints. [Team Project]
- 01/10 - 06/10 **Honeycomb Truss** NU Stress Analysis
Designed truss with nature-inspired “hairy honeycomb” structure for a drastically reduced resonance response. [Team Project]
- 09/09 - 12/09 **Lagrangian Mechanics** NU Theory of Machine Dynamics
Simulated the dynamics of a spring-mass damper system sliding down a spiral rod through automated derivation of its Euler-Lagrange equations of motion with Mathematica.
- 04/09 - 06/09 **Object Vibration Dynamics** NU Independent Study
Designed a Matlab *simulator* for vibration of 2D polygons which identified stable periodic orbits amidst intervals of chaos.

Select Publications

- [1] **I. Gemp**, S. Mahadevan. “Global Convergence to the Equilibrium of GANs using Variational Inequalities”. arXiv. 2018.
- [2] **I. Gemp**, M. Parente, S. Mahadevan. “Inverting VAEs for Improved Generative Accuracy”. NIPS Workshop: Advances in Approximate Bayesian Inference. 2017.
- [3] **I. Gemp**, S. Mahadevan. “Online Monotone Games”. arXiv. 2017.
- [4] I. Durugkar*, **I. Gemp***, S. Mahadevan. “Generative Multi-Adversarial Networks”. ICLR. 2017. *Equal contribution.
- [5] **I. Gemp**, G. Theocharous, M. Ghavamzadeh. “Automated Data Cleansing through Meta-Learning”. IAAI Challenge Paper. 2017.
- [6] **I. Gemp**. “Exploring the Dynamics of Variational Inequality Games with Non-Concave Utilities”. NIPS Workshop: Learning, Inference, and Control of Multi-Agent Systems. 2015.
- [7] **I. Gemp**, S. Mahadevan. “Finding Equilibria in Large Games using Variational Inequalities”. AAAI Spring Symposium. 2015.
- [8] S. Mahadevan, B. Liu, P. Thomas, W. Dabney, S. Giguere, N. Jacek, **I. Gemp**, J. Liu. “Proximal Reinforcement Learning: A New Theory of Sequential Decision Making in Primal-Dual Spaces”. arXiv. 2014.
- [9] **I. Gemp**, R. Carthew, S. Hilgenfeldt. “Cadherin-dependent cell morphology in an epithelium: constructing a quantitative dynamical model”. PLoS Computational Biology. 2011.