



IanGemp

PhD Candidate | UMass Amherst

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 Theodorou 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. 	

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Web Links

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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

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.