Gabriel Passamani Andrade

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Education

University of Massachusetts Amherst — Fall 2016 - Spring 2018
Master of Science in Applied Mathematics
Emphasis on Applications in Computer Science
GPA : 3.678

University of Massachusetts Amherst — Fall 2012 - Spring 2016
Bachelor of Science in Mathematics
Concentration in Pure Mathematics
Minor in Philosophy
Graduated Cum Laude
GPA : 3.675

Research Experience

University of Massachusetts Amherst-Yearly MS Project — Fall 2017 - Present

Recurrent Systems for Agent Decision Making and EMG-based Motor Control
-Exploring algorithms for agent decision making and control while mindful of supervision vs. performance
-Emphasis on paradigms fit for time-varying, multi-modal input like Reservoir Computing and Limit Cycle SOMs
-Aim to construct a network of recurrent sub-networks that perceive the environment and act given EMG signals

Adviser: Professor Qian-Yong Chen

Biologically Inspired Neural and Dynamical Systems Lab — Spring 2017 - Present

Hierarchical Network Structure and Dynamics Motivated by Brains
-Study networks with connectivity structures gleaned from biological insights on the cerebral cortex
-Developed a modular code base for running simulations of the system and analyzing its behaviour
-Proved properties about the model to understand and control its emergent dynamics
-Aim to encode robust associative memories as dynamics while facilitating integration of other parts of the project
-Part of the DARPA funded project entitled *Superior AI*

Adviser: Professor Robert Kozma

University of Massachusetts Amherst-Yearly MS Project — Fall 2016 - Spring 2017

Deep Neural Networks for Classifying Breast Masses From Mammograms
-Compared neural network architectures and classical machine learning techniques for breast mass classification
-Used transfer learning and data augmentation to cope with shortage of data
-Part of larger project aiming to develop an autonomous end-to-end system for breast mass detection and diagnosis

Adviser: Professor Nathaniel Whitaker

Mathematical Sciences Research Institute-Undergraduate Program — Summer 2015

A Matroid Generalization of Sperner's Lemma
-Proved impossibility in the general case of sharpening the lower bound in a paper published by Dr. László Lovász

-Found an overlooked case and made the necessary addenda to the proof and statement in the original paper
-Discovered a group action of S_n on subposets of the lattice of flats of matroids that was closely tied to the bounds

Advisers: Professor Francis Su & Dr. Mutiara Sondjaja

University of Massachusetts Amherst - REU — Summer 2014

Numerical Methods for Eigenvalue and Eigenvector Computation of Square Matrices
-Investigated and compared numerical algorithms for decomposing square matrices
-Designed simulations to compare empirical run times
-Demonstrated favorable cases not expressed in worst case complexity analysis using this empirical data

Adviser: Professor Nathaniel Whitaker

LSAMP COSEE-TEK Research Project — Spring 2014

Thermo-Photo-Saline Sensor Buoy Design and Construction
-Modelled and designed system for collecting measurements at variable depths with unpredictable environments
-Designed structure to securely integrate hardware and software during measurements
-Worked in a multidisciplinary team to build a sensor buoy that was deployed in Long Island Sound

Relevant Work Experience

Research Assistant — Summer 2017 - Present
Biologically Inspired Neural & Dynamical Systems Lab at UMass Amherst

Graduate System Administrator and IT assistant — Fall 2016 - Present
University of Massachusetts Department of Mathematics and Statistics

Peer Undergraduate Adviser — Fall 2015
University of Massachusetts Department of Mathematics and Statistics

Teaching Assistant - Calculus I & II for Life and Social Sciences — Fall 2014
University of Massachusetts Department of Mathematics and Statistics

Programming Languages & Operating Systems

Python, C, Bash, Java, Matlab, HTML, x86 assembly, and PDDL

Multiple Linux Distributions, OS X, and Windows

Service and Leadership

Graduate Researchers in Data (GRiD) — Summer 2017 - Present
Co-Chair of Operations
-Organize and Host workshops, talks, and Hackathons
-Help manage funds and secure assets for the organization

University of Massachusetts Provost Undergraduate Research Fellowship — Fall 2015 - Spring 2016
Mentor
-Helped guide the fellowship recipient in their research, class choices, etc.
-Chosen among senior undergraduates to represent the Mathematics Department

University of Massachusetts Outing Club — Spring 2013 - Spring 2016

Hiking Leader
-Organized and led hikes throughout New England
-Received multiple certifications related to wilderness survival and first aide

Awards, Honors, Grants

Outstanding Academic Achievement Award in Mathematics & Statistics — Spring 2016

Dean's List Six Semesters

Louis Stokes Alliances for Minority Participation (LSAMP) Scholar

Select Presentations

DARPA Site Visit, Amherst, MA	May 10th 2016
AMS/MAA Joint Mathematics Meeting (JMM), Seattle, WA	January 8th 2016
NSF SFS Site Visit, Amherst, MA	November 12th 2015
SACNAS National Conference, National Park, MD	October 29th 2015
MSRI-UP Final Talk, Berkeley, CA	July 24th 2015
REU Mini-Conference, New Haven, CT	July 25th 2014

Relevant Graduate Level Coursework

Information Theory (CS 650); Formal Language Theory (CS 501);Artificial Neural Network Dynamics Independent Study (CS 696); Artificial Intelligence (CS 683); Advanced Algorithms (CS 611); Numerical Analysis (Math 651); Cybersecurity Lecture Series (Math 591CF); Mathematical Statistics I & II (Stats 607 & 608); Dynamics, ODEs & PDEs (Math 532H & 534H); Real Analysis (Math 523H)

Misc. Skills

Fluent in English and Portuguese