Drew Levin

Contact Information

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Citizenship

USA

Research Interests

Complex systems, randomized intelligent search, agent-based models, distributed autonomous systems, biological modeling, competitive co-evolution

Education

University of New Mexico, Albuquerque, NM USA

Ph.D. Candidate, Computer Science (expected graduation date: Fall 2015)

- Research Topic: Biological Mechanisms of Autonomous Distributed Search
- Advisor: Professor Stephanie Forrest
- Area of Study: Complex Systems

Harvey Mudd College, Claremont, CA USA

B.S., Computer Science, May 2002

- Focus in artificial intelligence and computer algorithms

Honors

Harvey Mudd College

- Dean's List: Spring 1999, Fall 2000, Spring 2000, Fall 2001, Spring 2001

Academic Experience

University of New Mexico, Albuquerque, NM USA

Research Assistant **August 2006 to present**

- Current Project: Spatially explicit model of the lymphocyte diaspora in influenza-infected lung quantifies constraints of chemokine directed migration
  In Draft

Graduate Student **August 2006 to present**

- Passed Comprehensive Examination (Jan 2008)
- Graduate GPA: 4.02

Harvey Mudd College, Claremont, CA USA

Undergraduate Researcher **May 2001 to August 2001**

- Summer Research Fellow with Professor Jim Marshall
- Improved and modified code of Metacat for distribution

Publications

Levin D, Forrest S, Banerjee S, Clay C, Cannon J, Moses M, Koster F
A spatial model of the efficiency of T cell search in the influenza-infected lung
In submission

Levin D, Hecker J, Moses M, Forrest S
Volatility and spatial distribution of resources determine ant foraging strategies
Accepted: European Conference on Artificial Life (ECAL), 2015

Flanagan T, Fricke M, Hecker J, Letendre K, Levin D, Forrest S, Gordon D, Moses M.
Using information to improve collective search
Accepted: European Conference on Complex Systems (ECCS), 2015

Banerjee S, Levin D, Moses M, Koster F, Forrest S
The Value of Inflammatory Signals in Adaptive Immune Responses
ICARIS, 2011, p. 1-14

Mitchell H*, Levin D*, Forrest S, Beauchemin C, Tipper J, Knight J, Donart N. Layton C, Pyles J, Gao P, Harrod K, Perelson A, Koster F
Higher replication efficiency of 2009 (H1N1) pandemic influenza than seasonal and avian strains: kinetics from epithelial cell culture and computational modeling
J. Virology, Jan 2011, p. 1125-1135.
* *Authors contributed equally to this work.*

Posters

Drew Levin, et. al.
Replication efficiency of influenza: kinetics from cell culture and modeling
UNM CS Student Conference, March 1, 2010
Universtiy of New Mexico, USA

Presentations

Volatility and spatial distribution of resources determine ant foraging strategies
ECAL, July 22, 2015
University of York, UK

Ant Foraging as a Distributed Algorithm
UNM CS Student Conference, March 28, 2013
University of New Mexico, USA

The Value of Inflammatory Signals in Adaptive Immune Responses
ICARIS, July 18, 2011
Cambridge University, UK

Quantifying the Value of Inflammation
UNM CS Student Conference, April 5, 2011
University of New Mexico, USA

Designing and fitting an adjusted SIR model to experimental data
UNM CS Student Conference, April 2, 2009
University of New Mexico, USA

Fellowships

PIBBS: Program in Interdisciplinary Biological & Biomedical Sciences **2009-2011**
Research Fellowship
$22,537 per year for 2 years
UNM Department of Biology
University of New Mexico, USA

Awards

European Conference on Artificial Life 2015
Student Travel Bursary
£150
ECAL 2015
University of York, UK

Enrichment

Santa Fe Institute: Complex Systems Summer School **June 2010**
Student
St. Johns College and the Santa Fe Institute
Santa Fe, NM USA

Courses Taught

UNM Bio 409 / Bio 509 / Stat 479: Probability for Scientists
Hands-on introduction to probability and statistics for non-math majors
Co-teachers: Christian Gunning, Ara Kooser
Fall 2013

Guest Lectures

Complex Numbers and the Unit Circle
UNM CS 530: Geometric and Probabilistic Methods in Computer Science
Professor Lance Williams, Fall 2007

Introduction to Modeling
UNM CS 365: Introduction to Scientific Modeling
Professor Stephanie Forrest, Fall 2012

Fitting an ODE Model to Data
UNM CS 365: Introduction to Scientific Modeling
Professor Stephanie Forrest, Fall 2012

Modeling T cell search in the human lung
UNM CE 691: Civil Engineering Graduate Seminar
Professor Andrew Schuler, Fall 2013

Professional Experience

Infotech Systems Management, San Diego, CA USA

Software Engineer **January 2004 to Octobuer 2004**

- Created web applications to manage health records for local hospitals and insurance companies
- Applications included use of HTML, JavaScript, ASP, COM, Visual Basic, and SQL programming

Avail Medical Products, San Diego, CA USA

Software Developer **December 2002 to December 2003**

- Created new software applications to aid the management and accounting staff
- Applications included use of Visual Basic, VBA, FoxPro, and MS Access programming

Marine Biological Laboratory, Woods Hole, MA USA

Harvey Mudd College: Senior Clinic Participant **September 2001 to May 2002**

- Created a parallelized implementation of the Smith-Waterman algorithm for sequencing DNA
- Algorithm was specifically designed an optimized for the Itanium 64 processor
- Code was written in C and assembly

Pipeworks Software, Eugene, Or USA

Programming Intern **June 2000 to August 2000**

- Created software tools to aid senior programmers and artists in the development of games for the Microsoft XBox
- Code was written in C++

Service

Author: Matlabgeeks.com **May 2011 to present**

- Author of a five-part Matlab tutorial regarding the use of ODEs and DDEs in data fitting and analysis

Tutor: Intro to Computer Programming **Fall 2010 - Spring 2011**

- Tutored two eighth graders. We focused on object-oriented programming in Java.

President: CS Graduate Student Association **May 2008 to May 2009**

- Initiated and organized activites for the graduate students of the Department of Computer Science, University of New Mexico
- Organized and hosted the 2009 Computer Science UNM Student Conference

Technical Skills

Programming: C, C++, Java, Scala, Python, SML, Scheme, Prolog, Visual Basic, HTML, JavaScript, VBA, SQL, SVN, GIT, and others

MATLAB experience: linear algebra, neural networks, non-linear differential equations, genetic algorithms, statistics, gradient descent search, visualization

Applications: TEX, LATEX, BIBTEX, Open Office, Inkscape, Microsoft Office, and other common productivity packages for Windows, OS X, and Linux platforms

Operating Systems: Microsoft Windows, Linux

Mathematical Expertise

Function minimization including gradient descent and genetic algorithm methods

System modeling using systems of ODEs and agent based models

Algorithmic optimization, probability and statistics, complex systems, game theory