

AARON M. ROSENFELD

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EDUCATION

Drexel University, Philadelphia, PA
M.S., Computer Science

September, 2011 – June, 2013

Drexel University, Philadelphia, PA
B.S., Computer Science, *Cum Laude*
Concentrations: Artificial Intelligence, Operating Systems

September, 2006 – August, 2011

RELEVANT SKILLS

PROGRAMMING LANGUAGES

- Industry experience with Python, Java, C, C++, Sh
- Web development experience with HTML, PHP, JavaScript

OPERATING SYSTEMS

- Experience developing software for Linux, Windows, and FreeBSD

SOFTWARE

- Experience with various network simulators and emulators including NS2, NS3, and CORE
- gcc, gnuplot, Git, L^AT_EX, TikZ, Make, MySQL, SVN, vim

RESEARCH

- Extensive experience developing database consistency protocols for dynamic, unreliable networks
- Experience simulating and emulating algorithms in tactical environments
- Experience mathematically modelling network protocols under various conditions

EXPERIENCE

A.J. Drexel Institute for Applied Communications and Information Networking, Camden, NJ

Research Assistant

October, 2009 – Present

- Developed and implemented an anti-entropy algorithm to maintain data integrity across ad-hoc network nodes in lossy tactical conditions.
- Analytically and experimentally evaluated the performance of gossip algorithms under various network conditions.
- Published paper detailing gossip algorithm to the MOBIHOC 2011 MANET Workshop.

Research Assistant Co-op

April, 2009 – September, 2009

- Provided on-site support to U.S. Army CERDEC for software demonstrations.
- Re-designed PHP/C++ tool to provide media dissemination capabilities to mobile soldiers.

U.S. Naval Research Laboratory, Washington, DC

Student Researcher

March, 2010 – Present

- Examined the performance of existing anti-entropy protocols under high load.
- Studied the effects of tactical conditions on data propagation in mobile ad-hoc networks.
- Developed mathematical model of data propagation in wireless networks.
- Created a novel anti-entropy protocol using Naïve Bayesian Classifiers.
- Submitted paper detailing anti-entropy protocol to MILCOM 2011.

Drexel University & Czech Technical University, Prague, Czech Republic

Research Assistant

January, 2011 – March, 2011

- Selected as one of two students for international research exchange program between Drexel University and Czech Technical University.
- Developed AHOY, a simulation environment for comparing the effectiveness of sensor network deployments.

Drexel University, Philadelphia, PA

Teaching Assistant

September, 2010 – June, 2011

- Held weekly office hours to assist students.
- Graded homework assignments & exams.
- *Classes*: Software Design (CS350), Robot Lab (CS511/CS485).

phillyBurbs.com, Tullytown, PA

Web Developer

April, 2008 – March, 2009

- Created many extensions to the PHP-based Typo3 framework to suit the needs of PhillyBurbs. This included developing solutions for mass-mailings, contests, a simplified article submission interface, and RSS readers.
- Ran Subversion (SVN) server for development team.
- Setup a new development server with Debian, Apache web server, MySQL, and PHP (LAMP architecture).

MEMBERSHIPS AND CERTIFICATIONS

U.S. Government SECRET Security Clearance	2010 – Present
Upsilon Pi Epsilon	2010 – Present
<i>Member 2010–2011, President 2011–Present</i>	
International honor society for computing and information disciplines.	
Association for Computing Machinery (ACM) Member	2009 – Present
National Society of Collegiate Scholars Member	2008 – Present
For maintaining at least a 3.2 GPA and ranking in top 20% of the class.	
Drexel University Dean's List	2008 – Present
For earning a term grade point average over 3.6.	

HONORS AND ACTIVITIES

MILCOM – External Reviewer	2011
Premier international conference for military communications.	
Outstanding Senior Design Award	2011
For the AHOY sensor network simulator.	
Undergraduate Student Research Award	2011
Awarded annually to an undergraduate student in Department of Computer Science for outstanding contributions to research.	
<i>Topic: State Consistency in Mobile Ad-Hoc Networks</i>	
CRA Outstanding Undergraduate Research Award – Honorable Mention	2010
For showing outstanding research potential in an area of computing research.	
Maple Founders' Award	2010
Awarded annually to a student who shows potential for teaching or advanced work in computational or computer science.	

PROJECT HIGHLIGHTS

AHOY

<http://ahoy.googlecode.com>

Co-developer of AHOY, an event-based simulation environment designed to test networked multi-agent systems. Through user-defined, interchangeable component models, the effectiveness of different combinations of software agents, network configurations, and sensors can be tested in real-world environments. Scenario definitions specify a high-level model of a simulation's attributes, allowing for nondeterministic experiment progression. Real-time execution enables the integration of human interaction with the simulation. The distributed simulation engine provides the ability to run large-scale, complex experiments, reducing the cost of otherwise economically infeasible experiments.

Naïve Bayesian Classifier Taxonomic Webserver

<http://nbc.ece.drexel.edu>

Developer of the NBC job-queuing system for high-throughput taxonomic classification of metagenomic reads.

phpWatch

<http://phpwatch.net>

Lead developer of phpWatch, a free, open-source, web-based service monitoring system written in PHP. It includes features to query web services in a number of different fashions and notify the proper individuals through various means when a service is determined to be offline or malfunctioning. phpWatch has a rich API, allowing developers to create custom query and notification methods.

MIPS Modification

http://aaron-rosenfeld.com/mips/bp_mips.jpg

Developed a history-table branch prediction method for the IF/ID stages of the MIPS pipeline which can greatly reduce the number of flushes needed for conditional jumps.

RELEVANT COURSEWORK

COMPUTER SCIENCE

Advanced Artificial Intelligence
Data Structures and Algorithms
Software Design Patterns
System Architecture
Robotics

Advanced Programming Techniques
Electrical and Computer Engineering
Software Engineering
Operating Systems

Concurrent Programming
Mathematical Foundations
Symbolic Computation
Networking

MATHEMATICS

Differential Equations
Experimental Data Analysis
Statistics

Differential and Integral Calculus
Linear Algebra
Probability

Discrete Mathematics
Sequences and Series
Scientific Data Analysis

LAB SCIENCES

Bioinformatics

Electricity and Magnetism

Kinematics and Dynamics

PUBLICATIONS

- [1] Gail L. Rosen, Erin R. Reichenberger, and Aaron M. Rosenfeld, *NBC: the Naïve Bayes Classification tool webserver for taxonomic classification of metagenomic reads*, *Bioinformatics* **27** (2011), no. 1, 127–129.
- [2] Aaron M. Rosenfeld, *Messaging the Web: Implementing an SMS System in PHP*, *php|architect* **7** (2008), no. 9.
- [3] Aaron M. Rosenfeld, Dara Kusic, Joseph B. Kopena, and William C. Regli, *A Gossip-based Synchronization Protocol for State Consistency in Distributed Applications*, *MobiHoc Tactical MANET Workshop* (2011).
- [4] Aaron M. Rosenfeld and Joseph P. Macker, *Naïve Bayesian Classification of Anti-entropy Metadata Advertisements in Mobile Networks*, *MILCOM* (2011), **Under Review**.