

Christopher W. Tanner

CONTACT INFORMATION	Chris Tanner Boston, MA 02114 USA chris@chriswtanner.com
OBJECTIVE	To conduct statistical machine learning research and development, preferably in the field of natural language processing or pattern recognition.
CITIZENSHIP	USA
SECURITY CLEARANCE	Several clearances
RESEARCH INTERESTS	Generally: machine learning, data mining, artificial intelligence Fields: natural language processing, social network analysis, pattern recognition
EDUCATION	UCLA — Los Angeles, California M.S., Computer Science, June 2009 <ul style="list-style-type: none">• Thesis: <i>An Exploration of Animat-Based Evolution and Communication</i>• Adviser: Professor Michael G. Dyer• Area of Study: Machine Learning• Interesting Courses: Reasoning with Partial Beliefs (Bayesian Networks), Language and Thought, Approximation Algorithms, Data Mining (cs249), Animat-Based Modeling, Web Information Management (cs246), Parallel Programming (cs239)• GPA: 3.81 Florida Institute of Technology — Melbourne, Florida B.S., Computer Science, December 2006 B.S., Applied Mathematics, December 2006 <ul style="list-style-type: none">• 1st in graduating class• Major GPA: 3.95; Overall GPA: 3.85• Interesting Courses: Machine Learning (graduate), Artificial Intelligence (graduate), Neural Networks, Introductory Analysis, Abstract Algebra, Chaos Math, Numerical Analysis
PROFESSIONAL EXPERIENCE	MIT Lincoln Laboratory — Lexington, Massachusetts <i>Associate Staff Researcher in HLT Group</i> May 2009 to Present Face Recognition Project <p>As part of a 3-person research team that is responsible for building a complete end-to-end, large-scale face recognition system, I researched and developed classifiers based on Gaussian-Mixture Models (GMMs), Support Vector Machines (SVMs), and Local Binary Patterns (LBP).</p> Natural Language Processing <p>I have researched and developed a variety of content-based analytics for a large defense-oriented project. Specifically, I have explored Arabic-Name Expansion, named-entity recognition, entity disambiguation, keyword/phrase detection, document clustering, and topic modelling. For topic modelling, I have</p>

implemented approaches based on TF-IDF cosine-similarity, Probabilistic Latent Semantic Analysis (PLSA), and Naive Bayes classifiers. Additionally, I have developed a PLSA topic-modelling approach entirely within a MapReduce and Cloudbase architecture. I have explored approaches for solving fast approximations for nearest neighbor, which include algorithms Min-Hashing and Locality-Sensitive Hashing.

Streaming Analytics

I created an ensemble of classifiers (Decision Tree, SVM, Naive Bayes, KL-divergence-based) which accurately predicts character-encoding and language within highly noisy, large network streams of raw packets. The stream is so noisy that less than $\sim 10\%$ of traffic contains content. Yet, my system accurately detects and predicts character encodings and languages with $\sim 88\%$ accuracy, compared to the canonical Mozilla Chardet approach which achieves $\sim 42\%$.

Research and Developer Intern in HLT Group **June 2008 to September 2008** **Highly-Efficient Pattern Matching**

I developed an exact-match 2d algorithm that runs in $\theta(\frac{n^2}{m^2} + \frac{2n^2m}{q} + m^2)$, where m is the image length, n is the target image length, q is the number of unique color bytes within the target image. This outperformed the project's original software by running upwards of 20 times faster. I created KVM-based automated scripts that artificially simulate various humans' typical behavior, including web surfing via Internet Explorer, typing poems with Wordpad, and intelligently playing Solitaire.

Google, Inc. — Santa Monica, California

Software Engineer in Test for Picasa **May 2007 to September 2007**

Developed an extensively customizable program — with separate versions for Linux, Windows, and a web front-end — that empirically and thoroughly tests Picasa's™ autoupdate feature by exhaustively masquerading as the desired combinations of varying languages, operating systems, product versions, and more. Additionally, developed 20 regression-based, automated testing scripts for Picasa™.

United States Government — Maryland

Cryptanalysis and Exploitation Division **January 2007 to April 2007**

Developed various encoding and decoding error correcting codes in C++ so as to create an easy-to-use library of codes. Tasks required having a working knowledge of dynamic programming, linear algebra, and finite fields. Additionally, took initiative and volunteered to create a much-needed, automated installation package for a critical software system, for which I also wrote thorough documentation.

Research Intern in Speech Research Group **May 2006 to August 2006**

As a researcher and developer under minimal supervision, I explored ideas and implemented tools that concern active learning within the field of speech recognition. Having been exposed to Top Secret information, I am responsible for maintaining the highest possible degree of confidentiality and integrity.

Florida Institute of Technology — Melbourne, Florida

Adaptive Web Personalization Project **August 2005 to December 2006**

Working with Dr. Chan, I investigated non-invasive techniques for adaptive and personalized information searching and navigation guidance on the web. Based on our corpus of data collected from 11 users who each rated 200 web pages, we were ultimately able to automatically rank web pages in a way that improve Google's search results.

NASA Anomaly Detection Project **May 2004 to September 2005**

As part of a four-person team, I researched and implemented various clustering algorithms and state machines, in order to predict anomalous data (i.e., shuttle valve data).

Harris Corporation, Inc. — Melbourne, Florida

Software Testing Intern **May 2005 to August 2005**

Developed Perl and Shell scripts that allow users to easily test given software on various machines. Users can create and modify their own test harnesses and fully control how tests shall be performed, evaluated, and monitored.

PAPERS

Chris Tanner. *An Exploration of Animat-Based Evolution and Communication*. May, 2009. UCLA Master's Thesis.

Chris Tanner and Eric Wood. *Meerkat Manor: An Approach to Simulated, Genetic Co-Evolution*. December, 2008.

Chris Tanner and Leslie Choong. *Automated Story Conversion: Generating Children Stories from Adult Stories*. June, 2008.

Chris Tanner and Leslie Choong. *Utilizing Natural Language Processing Conceptual Dependencies to Infer Meaning of 'Dashed Hopes'*. May, 2008.

Chris Tanner, Irina Litvin, and Amruta Joshi. *Social Networks: Finding Highly Similar Users and Their Inherent Patterns*. February, 2008.

Chris Tanner, Chu-Cheng Hsieh, and Keenahn Jung. *Understanding Pure Social Networks: Structure, Connectivity, and Patterns of Interests*. November, 2007.

Chris Tanner. *Improving Web Personalization via User Interest Hierarchy and Scoring Techniques*. December, 2006.

Chris Tanner. *Accelerating Artificial Neural Network Learning via Weight Predictions*. April, 2005.

TEACHING
EXPERIENCE

UCLA — Los Angeles, California

Assistant for Assembly **March 2007 to June 2007**

Responsibilities included teaching two-hour discussion sections each Friday, holding office hours, assisting students with weekly projects, and grading assignments. The architecture of focus was MIPS.

Grader for Artificial Intelligence **January 2007 to March 2007**

Working for Dr. Rosen, I helped grade all quizzes, tests, homework, and projects. Software assignments were written in Lisp.

Florida Institute of Technology — Melbourne, Florida

Assistant for Data Structures and Algorithms **August 2006 to December 2006**

As an undergraduate, I was hired as a Graduate Student Assistant for Data Structures and Algorithms. Responsibilities included grading all tests and quizzes, helping to create weekly labs assignments, and assisting students in each lab session.

AWARDS

Florida Institute of Technology

- Florida Tech's Outstanding Mathematician (2004 - 2005)
- Florida Tech's Outstanding Computer Scientist (2003 - 2006)
- Florida Tech Distinguished Scholar (2004 - 2006)
- Honorable Mentions Senior Design Project (2006)
- Dean's List (2002 - 2006)

Association for Computing Machinery (ACM)

- Three ACM Southeast Regional Programming Competitions (placed *6th* in 2005)

Phi Eta Sigma

- National Honor Society Scholarship Winner (2004 - 2005)

SERVICE

Florida Institute of Technology — Melbourne, Florida

Resident Assistant

August 2003 to December 2006

For 18 residents every year, my leadership responsibilities included interpersonal tasks such as developing an enjoyable community, handling others' conflicts, and reporting issues.

SOFTWARE
FLUENCY

Operating Systems: Unix/Linux — roughly 12 years experience where it has been the primary O.S. on my computers.

Strongest Language: JAVA — 8 years of consistent experience.

Heavy exposure: Python, Perl, Korn/Bash/Shell scripting, C++, C, IBM Info Sphere

Light exposure: Haskell, Lisp, Ada, *Basic, Eggplant, Fortran

Mathematical Software Experience: MATLAB, Mathematica, Maple, R