

SNEHA POPLEY

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Summary

- Research Interests in Programming Languages include functional programming, logic programming, logical frameworks, type systems, higher-order abstract syntax, and theorem proving
- Involved in research since freshman year of undergraduate studies
- Proficient in Java, C/C++, Ruby, Unix, and Windows
- Experience with Coq, SASyLF, Twelf, ML, and OCaml

Education

Texas Christian University

Bachelor of Science, Computer Science & Bachelor of Arts, Mathematics

Fort Worth, TX

May 2010

- Expected Graduation with Departmental Honors
- Overall GPA – **3.9/4.0**
- CS GPA – **3.9/4.0**

Posters and Presentations

Presented Posters

S. Popley, A. Sanchez, “Integration of Texture and Shape algorithms with Face Recognition using Eigenvectors”, *TCU Student Research Symposium*, April 2009.

S. Popley, A. Sanchez, “Shape-Based Face Detection in Images”, *TCU Student Research Symposium*, April 2008.

In Progress (Papers and Posters)

S.Popley, J. Aldrich, R. Simmons. “Formalization of SASyLF in M_2^+ ”

S.Popley, J. Alvord, P. Stromberg, A. Grosso, J. Marquez, F. Wesner, D. Payne. “Gesture Recognition Using Sunspots”, *TCU Student Research Symposium*, April 2010.

Research Experience

Research Intern

Institute for Software Research (Carnegie Mellon University)

2009 – Present

Pittsburgh, PA

- Working with Dr. Jonathan Aldrich and Robert Simmons to formalize SASyLF, an LF-based proof assistant, using M_2^+
- Creating SASyLF Core Calculus that syntactically resembles M_2^+ but semantically resembles SASyLF as a part of the formalization process
- Attended Principles of Programming (POP) seminars throughout the summer
- Presented research to the POP and PLAID research groups at Carnegie Mellon

Research Assistant

Programming Languages Department (University of Pennsylvania)

Summer 2008

Philadelphia, PA

- Paired with Dr. Stephanie Weirich through the Computing Research Association- Distributed Research Experience for Undergraduates (CRA-DREU)
- Studied the properties of dependently-typed languages through Coq by the analysis of Binary Search Tree algorithms
- Attended weekly paper discussions as a member of the PLClub
- Presented results to graduate students and professors in the Programming Languages Department

- Research Assistant** **2007–Present**
Crescent Lab for Intelligent Systems (TCU Computer Science Dept.) **Fort Worth, TX**
- Contributing to the Crescent Lab as a Research Assistant since freshman year
 - Collaborate with Dr. Antonio Sanchez on Image Recognition and Face Detection
 - Represent Crescent Lab at the Annual Student Research Symposium

Work Experience

- Tutor** **2007–Present**
TCU Computer Science Dept. **Fort Worth, TX**
- Assist students with their Java and C programs at the helpdesk 2-3 times a week
 - Worked with about 200 students over the past 3 years
 - Aid students in their development, from “Hello World” programs to implementing control structures, collection classes, listeners, and classes

- Student Worker** **2006–2008**
TCU International Admissions **Fort Worth, TX**
- Managed data entry of applicants
 - Interacted with prospective students in person as well as electronically
 - Assisted in planning and implementing the annual Phonathon for International Ambassadors

Other Experience

- Participant** **2006–Present**
ACM Programming Contest **Fort Worth, TX**
- Appointed President of the local team in 2009
 - Duties includes planning weekly meetings, choosing problems for practice meetings, selecting teams for regional contest, and organizing department contests every semester
 - Solve and discuss practice problems during weekly meetings with the teams
 - Selected to represent TCU at the ACM South Central Regional Programming Competition since freshman year

- Web Manager** **2008–2009**
TCU Chancellor’s Leadership Program Website *http://www.clp.tcu.edu* **Fort Worth, TX**
- Created and maintained an online resource for the Chancellor’s Leadership Program that houses applications, pictures, events, and project information
 - Integrated Google Calendar and Picasa into the website to simplify data updates while using Ajax, HTML, and JavaScript
 - Supervising handover of website to successor while investigating ways to make system accessible to non-technical users

Projects

- Formalization of SASyLF** *http://student.tcu.edu/sepopley/summer09.html* **2009–Present**
- Formalizing SASyLF, an LF-based proof assistant specialized to checking theorems about programming languages and logics, in M_2^+
 - Creating a core calculus that acts as a transition between SASyLF and M_2^+ while exploring other logical frameworks for formalization such as Delphin and Beluga
 - Converting summer project into senior Honors thesis with committee members Dr. Jonathan Aldrich, Dr. Dick Rinewalt, Dr. Antonio Sanchez, and Dr. Rhonda Hatcher
 - Using: Twelf, SASyLF, and M_2^+ with experimentation in JastAdd, JavaCC, and ML,

Analysis of Dependent Types <http://student.tcu.edu/sepopley/summer08.html> **Summer 2008**

- Implemented Binary Search Tree algorithms in Coq to analyze the properties of dependent types in programming languages
- Modified the existing algorithms to observe the changes in proof structure and tactics
- Analyzed possible improvements for tactics and functional programming
- Presented findings to a dozen graduate students and professors in the University of Pennsylvania Programming Languages Dept.
- Used: Coq, CoqIDE

Shape, Texture, and Color-based Image Recognition <http://crescent.cs.tcu.edu/> **2007–2009**

- Integrate Generalized Hough transform with ALISA to segment faces from images
- Customize and modify dataflows in JavALISA to include Generalized Hough transform
- Develop classifier files to improve image segmentation in ALISA
- Implemented Least Squares to approximate face position when a face is the lone notable area of skin present in the specified image
- Using: JavALISA, Java 5, ImageJ, Eclipse

Gesture Recognition Using Sunspots and Mobile Devices **2009–Present**

- Member of Computer Science Senior Capstone Project to implement gesture recognition using Sun SPOTS (java programmable wireless sensor network motes)
- Analyzing and improving a Hidden Markov Model based algorithm implemented in Wiigee, an open-source gesture recognition library for accelerometer-based gestures
- Involved in miscellaneous presentation and software engineering tasks such as project planning, video-editing, etc
- Using: Java 5, Eclipse, Wiigee, Adobe CS4, Microsoft Project, etc

Scholarships Awarded

- \$2500 research grant for Honors Project on “Formalization of SASyLF in M_2^+ ” from TCU Science and Engineering Research Center (SERC) and TCU Undergraduate Research and Creative Activity Initiative (URCAI) (2009)
- \$750 research grant from TCU for Image Recognition for the Crescent Laboratory (2007)
- \$6000 summer research stipend from CRA at the University of Pennsylvania (2008)
- Google Anita Borg Memorial Scholarship Finalist (2009)
- Dan Drew Scholarship from Upsilon Pi Epsilon national honor society (2009)
for computing sciences (\$1250)
- TCU Women’s Scholarship (\$3000) (2009)
- TCU Provost’s Scholarship (2006–Present)

Prizes and Honors

- TCU Scholar (2006–2008, 2009–Present)
- TCU Dean’s List (2006–Present)
- Nominated for TCU Pillar of Leadership Award (2008)

Society memberships

- Upsilon Pi Epsilon National Honor Society for Computing Sciences, *President* (2009–Present)
- Pi Mu Epsilon National Mathematics Honor Society (2008–Present)
- Mortar Board National College Senior Honor Society (2008–Present)
- Association for Computing Machinery (2006–Present)
- TCU Honors College (2006–Present)

Involvement and Service

- Communications of the ACM, *Blogger* (2009)

- OOPSLA (International Conference on Object Oriented Programming, Systems, Languages, and Applications), *Student Volunteer* (2009)
- Grace Hopper Celebration for Women in Computing, *Student Volunteer* (2009)
- TCU Computer Science Society, *President in 2008* (2006–Present)
- Chancellor's Leadership Program, *Steering Committee Member 2007-2009* (2006–Present)
- State of Leadership Conference, *Volunteer* (2006–Present)
- Connections : First Year Experience (TCU Leadership Center), *Mentor* (2007)
- Resident Student Ambassador, *Volunteer* (2007)
- College Student for a Day, *Mentor* (2006–Present)
- International Ambassadors, *Organizer until 2008* (2007–Present)
- Boo at the Zoo, *Volunteer* (2006)