

# SNEHA POPLEY

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## Summary

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- 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++, Unix, and Windows
- Experience with Coq, SASyLF, Twelf, ML, and OCaml

## Education

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**University of Chicago**  
*MS, Ph.D. in Computer Science*

**Chicago, IL**  
 September 2010-Current

**Texas Christian University**  
*Bachelor of Science, Computer Science & Bachelor of Arts, Mathematics*

**Fort Worth, TX**  
 May 2010

- Summa Cum Laude
- Departmental Honors
- Overall GPA – **3.9/4.0**, CS GPA – **3.9/4.0**
- Leadership Scholar

## Posters and Presentations

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### Presented Posters

- **S.Popley**, J. Aldrich, R. Simmons. “Formalization of SASyLF”, *TCU Student Research Symposium*, April 2010. (*People’s Choice Award*)
- J.Alvord, A. Grosso, J. Marquez, **S. Popley**, P. Stromberg, F. Wesner, D. Payne. “FROG Recognizer of Gestures”, *TCU Student Research Symposium*, April 2010. (*Best Poster in Computer Science & People’s Choice Award*)
- **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.

### Papers

- **S.Popley**, J. Aldrich, R. Simmons. “Formalization of SASyLF” (*Honors Thesis*)

## Research Experience

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**Research Intern**  
**Institute for Software Research (Carnegie Mellon University)**

**Summer 2009**  
**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** **Summer 2008**  
**Programming Languages Department (University of Pennsylvania)** **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** **2007–2009**  
**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

## Projects

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- Formalization of SASyLF** <http://home.uchicago.edu/~sepopley/summer09.html> **2009–2010**
- 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
  - Converted 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://home.uchicago.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
- FROG Recognizer of Gestures** <http://brazos.cs.tcu.edu/0910/> **2009–2010**
- Member of Computer Science Senior Capstone Project to implement gesture recognition using Sun SPOTS (java programmable wireless sensor network nodes)
  - 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

## Teaching Experience

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- UofC CMSC 226 Implementation of Computer Languages** **Winter 2011**  
**Teaching Assistant** **Chicago IL**
- Assisting in creating test cases, grading, and monitoring subversion usage /stability
- UofC CMSC 151 Intro to Computer Science - Scheme** **Autumn 2010**  
**Teaching Assistant** **Chicago IL**
- Graded and held office hours to assist students with their programs and quiz preparation. Occasionally helped with lab sessions.
  - Attended weekly meetings about the development and progress of the class with the other TAs and John Reppy
- TCU COSC 10403 Intro to Programming – Java/C** **2007–2010**  
**Teaching Assistant** **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
- TCU COSC 30403 Programming Language Concepts** **Spring 2010**  
**Grader** **Fort Worth, TX**
- Graded labs in 6-7 different languages over the course of the semester

## Other Experience

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- Software Engineering Intern** **Summer 2010**  
**Facebook** **Fort Worth, TX**
- Worked in the Messaging Team on Project Titan (released Nov 15, 2010)
  - Focused on improving parsing of incoming email messages on the server
  - Interacted with members of the backend, frontend, and server level to design a solution
- Participant** **2006–2010**  
**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

## Scholarships Awarded

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- McCormick Fellowship (University of Chicago) (2010–Present)
- \$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)
- Dan Drew Scholarship from Upsilon Pi Epsilon national honor society for computing sciences (\$1250) (2009)
- TCU Women’s Scholarship (\$3000) (2009)
- TCU Provost’s Scholarship (2006–2010)

### Prizes and Honors

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- Boller Award for Best TCU Honors Presentation (\$1250) (2010)
- Google Anita Borg Scholar (*Finalist in 2009*) (2010)
- TCU Student Research Symposium (SRS) Best Poster in Computer Science for “FROG Recognizer of Gestures” (2010)
- SRS People’s Choice Award for “Formalization of SASyLF” (2010)
- SRS People’s Choice Award for “FROG Recognizer of Gestures” (2010)
- TCU Senior Scholar in Computer Science (2010)
- TCU Scholar (2006–2008, 2009)
- TCU Dean’s List (2006–2010)
- TCU Leadership Scholar (2010)
- Nominated for TCU Senior Legacy Award (2010)
- Nominated for TCU Pillar of Leadership Award (2008)

### Society memberships

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- Phi Beta Kappa National Honor Society (2010–Present)
- Upsilon Pi Epsilon National Honor Society for Computing Sciences, *President 2009* (2009–Present)
- Pi Mu Epsilon National Mathematics Honor Society (2008–Present)
- Mortar Board National College Senior Honor Society (2008–Present)
- TCU Honors College (2006–2010)

### Involvement and Service

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- 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* (2006–2010)
- Chancellor’s Leadership Program, *Steering Committee Member 2007-2009* (2006–2010)
- Museum of Science and Industry, *Volunteer* (2011–Present)
- State of Leadership Conference, *Volunteer* (2006–2009)
- Connections : First Year Experience (TCU Leadership Center), *Mentor* (2007)
- College Student for a Day, *Mentor* (2006–2009)