Ph.D. Program Overview

Department of Computer Science
Carnegie Mellon University
Frank Pfenning
CSD IC August 2004
Who I Am

• Researcher, teacher, advisor
• Squash player
• Help is around the corner
  – Your advisor (once you have one)
  – Sharon Burks (Associate Department Head)
  – Me (Director of Graduate Programs, CSD)
  – Jeannette Wing (Department Head)
  – Patrick Riley (Ombudsperson)
CSD Ph.D. Program Goals

• Provide environment for you to become
  – Outstanding researchers
  – Excellent teachers
  – Future leaders

• The rest is up to you
  – Initiative
  – Dedication
  – Service
Seven Circles of CSD

- Immigration course
- Coursework
- Skills requirements
- Teaching
- Thesis proposal
- Dissertation
- Emigration course
Immigration Course

- Overview of department and school
- Faculty introductions
  - Research projects
  - Personal styles
- Social events
  - Area parties
  - Login ball
    Fri Oct 1, 7:30, Pittsburgh Golf Club
Finding an Advisor

• Talk to individual faculty
  – Starting right away
  – Sometimes more than once

• Create ranked list (by Sep 24)
  – Should have more than one name
  – Comment on choices

• Handshake committee meeting
  – Reconcile faculty and student lists, funding
  – Commitment is not for life!
Working with an Advisor

• Advisor is mentor, friend, not boss
• Research from day one
  – Project (with fellow students, faculty)
  – Reading and exploration
• Advising styles differ greatly
  – Understand mutual expectations
Changing Advisors

• Many students change advisors
  – Evolving research interests
  – Mismatch of personal styles
  – Advisor leaving
  – **Not** funding issues

• A routine, constructive process
  – **Not** a personal or professional failure
  – Talk to me, old advisor, new advisor
  – Co-advising sometimes appropriate
Coursework

• Five star courses, one each from 5 areas
  – Breadth of knowledge
  – Exposure to research styles in different areas
  – Not a filter (no qualifiers or comprehensives)
• Three free graduate electives
  – At least two from within school (SCS)
  – Fahlman unit (TA grad course)
  – Satya unit (supervised project)
  – Veloso unit (outreach/vision)
Areas and Star Courses

• Algorithms/Complexity
  – Algorithms
  – Complexity theory

• Programming Languages
  – Type systems
  – Semantics

• Artificial Intelligence
  – Advanced AI Concepts
  – Machine Learning
  – Planning, Execution, and Learning

• Software Systems
  – Advanced operating and distributed systems
  – Database management systems
  – Networking

• Computer Systems
  – Computer architecture
  – Optimizing compilers
Skills Requirements

• Speaking
  – Research talk to general CS audience
  – Speaker’s Club: uniform, high standards

• Writing
  – Two faculty members, one students
  – Iterative process

• Programming
  – Currently under review by DRC
Teaching

• Teaching requirement
  – Serve as teaching assistant twice
  – Assigned by undergraduate program administrators
  – Recitation, office hours, assignments, exams, grading, occasional lecture

• TA certification for non-native speakers

• Teaching fellow program
  – With Eberly Center (IC talk today, 1:30)
Thesis Proposal

• Usually after courses, skills, teaching
• Assemble committee with your advisor
  – Typical: Advisor + 2 CSD/SCS Faculty
    + 1 Outside CMU
• Written document contains
  – Early thesis outline
  – Partial results
  – Background and related work
Thesis Proposal Presentation

• 50 minute talk
• Outlines preliminary results and plans
• Convince committee that
  – You have a viable topic
  – You know prior and related work
  – You can carry out the remaining research
• Obtain committee feedback and advice
• Not pass or fail
Dissertation

• Good writing takes time
  – No staple-gun theses
• Stay in touch with the committee
  – Correct course if necessary
  – Remaining focused can be hard
• Defense
  – Give your committee time to read the thesis
  – Sometimes tricky to schedule
  – Real test comes before
Emigration Course

• Lectures on
  – Life in the real world (academia, research lab)
  – Job talk and interviewing
• Might attend some before your last year!
Reminder: Program Goals

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Help and Further Information

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  – Your advisor (once you have one)
  – Sharon Burks (Associate Department Head)
  – Me (Director of Graduate Programs, CSD)
  – Jeannette Wing (Department Head)
  – Patrick Riley (Ombudsman)

• Ph.D. document, other information via
  – http://www.cs.cmu.edu/~burks