Computer Science PhD Student Orientation

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http://cs.gmu.edu

Goals

- Meet colleagues and faculty
- Intro to CS Department
- Resources
- PhD Degree Requirements
- General Tips
Computer Science @ GMU

- Department of Computer Science
  - 43 faculty members
  - Wide range of research interests and expertise

- Programs
  - Undergraduate
    - BS-CS and BS-ACS (Applied CS)
  - Graduate
    - Four Masters programs, approx. 550 students
      - MSCS, MS-ISA, MS-SWE, MS-INFS
    - Two PhD programs
      - CS PhD and IT PhD
      - 121 students in CS PhD Program
      - 13 new PhD students

Key People

- Director, PhD CS program and Chair of the Computer Science Dept
  - Prof. Gomaa

- Associate Director, PhD CS program
  - Prof. Motro

- Your academic advisor
  - Assigned to you based on the areas you said you were interested in
  - Not your dissertation (research) advisor

- CS Office staff
  - Therese Michael (PhD program specialist)
  - Nooshi Mohebi (office manager)
CS PhD Degree Requirements

- GMU Catalog is the official source
- Lots of information on CS web site
  - CS Information Wiki has a section on PhD student topics
- Degree requirements
  - Course work
  - Qualifying Exams
  - Oral Comprehensive Exam
  - Dissertation Proposal
  - Dissertation

- 72 credits (GMU requirement) post Bachelor's degree
- Up to 30 credits for an approved MS degree
- 42 credits post-Masters
  - CS 700 (3 credits) - Quantitative Methods and Experimental Design in Computer Science
  - 4 advanced graduate courses (12 credits)
    - Course must have approved graduate prerequisite
    - Advanced 600 level and above
  - CS 800 (2 x 1 credits) - CS Colloquium
  - CS 990 (1 credit) - CS Proposal Preparation
  - At least 24 (12 + 12)
    - CS 998 (proposal) and CS 999 (dissertation)
PhD Information Technology

- PhD in IT - Concentrations
  - Information Systems,
  - Software Engineering,
  - Information Security and Assurance
- 72 credits (GMU requirement) post Bachelor’s degree
- Up to 30 credits for an approved MS degree
- 42 credits post-Masters
- At least 24 credit hours
  - IT 990 (1 credit) - Proposal Preparation
  - IT 998 - Dissertation Proposal
  - IT 999 - Dissertation Research

PhD CS Qualifying Exams

- Qualifying exams test your knowledge in four different areas of CS
- Need to pass exams in four areas
  - Foundations of CS + any 3 out of 8 areas (software construction, software modeling, OS, networks, languages & compilers, AI, information security, databases)
  - Primary graduate course for each CS area
    - Two courses for Foundations of CS
    - If you have MS degree, you may already have taken appropriate course(s)
- Exams offered in August and January
  - Two chances to pass four exams
  - Recommend you take qualifying exams as soon as possible
Dissertation Committee

- Each student must form a dissertation committee
- Four (or five) members
  - Three members must be tenured or tenure-track faculty in CS Department.
  - One member from outside CS Department
  - Chair of the dissertation committee is your dissertation advisor
    - Must be tenured or tenure-track faculty in the Volgenau School.
  - Committee must be approved by the director of the CS PhD program.

Comprehensive Exam

- Students must pass an oral comprehensive exam
  - Typically two hours
- Demonstrate depth of knowledge in intended area of research, and ability to perform original research in that area.
- Scope of oral exam is defined by a reading list prepared by the student and dissertation director.
  - Includes research papers and textbooks that cover
    - Basic tools used in the research area
    - Fundamentals of the research area, and
    - State-of-the-art in the specific focus of research.
- Reading list must be accompanied by a one-page description of intended research
Dissertation Proposal

☐ Each student must prepare written dissertation proposal.
☐ Student enrolls in CS 998 Doctoral Dissertation Proposal.
☐ Proposal must be presented to and approved by dissertation committee.
☐ Committee determines:
  ☐ Whether the proposal has merit,
  ☐ Can lead to significant research contributions
  ☐ If student has knowledge and skills to complete proposed work successfully, and in timely manner.
☐ Upon completing proposal successfully, student is advanced to candidacy for the PhD degree.

Dissertation Preparation and Defense

☐ While preparing dissertation, the candidate enrolls in CS 999 Doctoral Dissertation.
☐ When the work is complete, the dissertation is defended.
☐ Public defense is preceded by a pre-defense meeting
  ☐ Candidate meets with dissertation committee members and Director of CS PhD program (or his representative).
☐ If the committee approves, the candidate may then schedule the final public defense.
☐ At least one month between the pre-defense and defense
Dissertation Defense

- Dissertation must be available to committee at least two weeks before defense.
- Dissertation Defense is oral and open to all
- Dissertation
  - Must make significant contributions to its area
  - Be publishable in refereed journals or conferences
- Pass defense ->
  - Make final changes to dissertation if needed
  - Awarded PhD CS
- Fail defense ->
  - Candidate may request a second defense

Progress in PhD CS

- Annual Progress Report
  - Submit report by the end of September every year
- Time frames for Graduation
  - Maximum time allowed from starting PhD program to being advanced to candidacy - 6 years
  - Maximum time allowed from being advanced to candidacy to completing/defending dissertation - 5 years
Succeeding in Graduate School

- Do well in courses
- Finding a research advisor
  - Take courses on topics of interest
  - Attend seminars
  - Look at faculty web pages
  - Figure out what you are interested in
- Many resources online
  - Will have links on CS wiki

International Students

Students with F-1 or J-1 visas:
- Must be full-time students
  - At least 9 credit hours per semester
  - 6 credit hours for GTAs and GRAs
- Cannot switch to part-time status
- Must have degree status versus non-degree
- See Prof. Motro or your Academic Advisor if you have a problem
Logistics & Computing Resources

- GMU Email
- IT&E Computing Labs
  - http://labs.ite.gmu.edu
  - Online procedure for obtaining accounts - once you have your GMU email id
- Space in Research labs and GTA labs for full-time PhD students
  - To be assigned soon
  - Access to computing resources of the lab
- GTA Room access
  - Details at orientation this afternoon

Honor Code Provisions

- The Honor Code of GMU deals specifically with:
  - Plagiarism
  - Cheating and attempted cheating
  - Lying and
  - Stealing
- Plagiarism encompasses the following:
  - Presenting as one's own the words, the work, or the opinions of someone else without proper acknowledgement. This includes material appearing on the Internet
  - Borrowing the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgement
  - Students are advised to check the Honor Code provisions on the syllabus of each class for further elaboration provided by the instructor
CS Department Faculty

- 43 Full-time Faculty
  - 14 Full Professors
    - Barbara, J. Chen, DeJong, Gomaa (Chair), Kerschberg, Menasce (Associate Dean), Motro, Offutt, Pullen, Sibley, Setia, Sood, Tecuci, Wechsler
  - 15 Associate Professors
  - 9 Assistant Professors
    - Allbeck, Li, Lien, Lin, Malek, Rangwala, Shehu, Sousa, Stavrou
  - 5 Instructional Faculty
    - Alazzawe, Dobolyi, Heishman, T. Maddox, Nordstrom
- 19 Adjunct Faculty

Research Expertise

- Greatest CS Department strength is our faculty
  - Established faculty: international reputations
  - Junior faculty: tremendous potential
- Publications in top international journals and conferences
- Research funding from top government agencies (NSF, DARPA, NASA, etc) and companies
- Total Research Funding by CS Dept and Research Centers
  - AY 2008: $ 7.3 Million
- NSF CAREER Awards by CS Faculty
- AFOSR YIP Awards by CS Faculty
Areas of Research Expertise

- Algorithms and Theory of Computation
- Artificial Intelligence, Computer Vision and Robotics
- Computational Biology and Biometrics
- Databases and Data Mining
- Evolutionary Computation and Machine Learning
- Graphics and Image Processing
- Information and Network Security
- Parallel and Distributed Computing
- Software Engineering
- Systems and Networks

Research Centers and Labs

**Research Centers**
- C4I Center (Pullen)
- Center for Secure Information Systems (Jajodia)
- Learning Agents Center (Tecuci)
- Health Information Technology (Kerschberg)
- Smart Grid (Brodsky)

**Research Laboratories**
- Autonomous Robotics
- Attack Prevention and Detection
- Biometrics and Forensics
- Computer Vision and Robotics
- Data Mining
- Evolutionary Computation
- Graphics
- Network Security
- Software Engineering
- Systems and Networking
Questions??

For more information, see:
http://www.cs.gmu.edu/programs/phd/cs/