2020 Computer Science Graduate Program Orientation

Cal Poly Pomona
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Welcome aboard!
Fall 2020: 35 new students
Where did they graduate from…

- University of California Santa Cruz
- University of California, San Diego
- University of California, Los Angeles
- San Jose State University
- Oregon State University
- University of Texas at San Antonio
- California State University, Northridge
- University of Illinois at Urbana Champaign
- California State University San Bernardino
- University of California, Davis
- University of California, Riverside
- Tamkang University
- Cal Poly Pomona
Personnel

- Chair:
  - Dr. Daisy Tang (ftang@cpp.edu)

- Graduate program director (program advisor/coordinator):
  - Dr. Mohammad Husain (mihuasain@cpp.edu)
  - General inquiries: mscs@cpp.edu

- Administrative support coordinator:
  - Annie Montes (amontes@cpp.edu)
  - Nicole Garcia (nicolleg@cpp.edu)
Two very important websites!

- CS Current MS Student Handbook
  - https://www.cpp.edu/sci/computer-science/current-graduate-students/index.shtml
- CS MS Forms Collection
  - https://www.cpp.edu/~mihu/MSCS.html
**Program Information**

- **Total units:** 30 units

- **Required courses:** 10 units  
  - 5250, 5300, 5800, 6640

- **Required project/thesis**  
  - Project: 6910 (1 unit) + 6950 (1 units)  
  - Thesis: 6910 (2 units) + 6960 (3 units)

- **Elective courses**  
  - Project: 18 units  
  - Thesis: 15 units
Master’s Degree Contract

- Your study plan “contract”
- Clarify what is needed to achieve your degrees
- Changes are submitted through petition
- You can download a copy here:
  - https://www.cpp.edu/~mihuain/MSCS.html
Submission Deadline

A graduate contract must be prepared and submitted for approval to Dr. Husain no later than the end of the second semester of attendance (you have completed the core courses and ready to enroll for 6910)

- https://www.cpp.edu/~sci/computer-science/current-graduate-students/index.shtml

Planned course offerings

- http://www.cpp.edu/~sci/computer-science/current-graduate-students/planned-future-course-offerings.shtml
Conditional admission requires the completion of a list of foundation courses. Listed explicitly on an e-mail you have received from mscs@cpp.edu after your admission. Discuss with Dr. Husain for any concern.

For example, you have taken the course elsewhere. You need to bring your transcript and course syllabus to waive the course. Note that you might have university conditions to meet as well, for example submitting your official transcripts or other required documents. Check your To-Do or Holds on BroncoDirect.
Prerequisite Courses

They should be taken as soon as possible by the deadline specified in the email

Dangling courses:
May not enroll in some other courses
Delay your graduation

Upon completion, file a petition to Dr. Husain to change status to unconditional
Planning Your Study

- What courses to take first?
  1) Prerequisite courses listed on your email if you are a conditional student (or consult Dr. Husain)
  2) Core courses
  3) Elective courses

- Take most of the courses in the first years
- Focus more on thesis or project in the second and third years (if necessary)
- Do not overcommit
Permission Number Requests

Unable to register through BroncoDirect?

• Requires (regular) permission number or have various holds
• Permission numbers can’t solve all your registration problems due to holds etc.
• Permission numbers let you enroll in the class, but you can still be waitlisted

Contact Dr. Husain with your:

• Full name
• Bronco ID
• Courses you’d like to take
• Follow the template given such an email request
Each student has two advisors:
- General advisor: Dr. Husain
- Research advisor (CS Full-time Faculty), with whom you will complete your project or thesis
Directed Study (CS 6910)

You must be in unconditional status

Suggested to talk to at least 3 professors before you decide whom you’d work with

Your research advisor must submit a request to CS office to open a 6910 section

Afterwards, you should register for CS 6910 and work with your research advisor to develop a project/thesis proposal
You must have a final letter grade (e.g. not RP) in 1 unit of CS 6910

You submit a form to CS office with signatures from your Project Committee members (your research advisor + 1 committee member)

The CS office will open the 6950 section for you to register.

Form available at:

https://www.cpp.edu/~mihuain/MSCS.html
Thesis (CS 6960)

- You must have a final letter grade (e.g. not RP) in 2 units of CS 6910
- You submit a form to CS office with signatures from your Project Committee members (your research advisor +2 committee member)
- The CS office will open the 6960 section for you to register.
- Form available at:
  - https://www.cpp.edu/~mihuasain/MSCS.html
Faculty Research Interests

- http://www.cpp.edu/~sci/computer-science/faculty-and-staff/faculty-research-interests.shtml
Cybersecurity

• Multiple faculty members in this domain: Dr. Amamra, Dr. Chen, Dr. Husain.

• More information can be found at:
  • www.cpp.edu/~polysec

• Scholarship available for MS students pursuing a cybersecurity career at a federal/state agency or lab upon graduation
Proactive Cyber Threat Intelligence

Dr. Ericsson S. Marin
santanamarin@cpp.edu
Malicious hackers are increasingly using the deepweb and darkweb (D2Web) to share knowledge and achieve their cybercriminal goals.

They often discuss on hacker communities how to:

1. Identify software vulnerabilities;
2. Create or purchase exploits;
3. Choose a target and recruit collaborators;
4. Obtain access to the infrastructure needed;
5. Plan and execute the attack.

This online hacker behavior also provides intel for defenders!!!

Reactive cybersecurity

Proactive cybersecurity

The information shared by hackers on online communities can be leveraged as precursors to various types of cyber-attacks.
Motivation: the correlation between high user engagement on online hacker communities and vulnerability exploitation.

Interdisciplinary Research: Computer Science (AI, Machine Learning, Social Network Analysis), Criminology, Sociology applied to Cybersecurity.

Research Topics: (Cyber-Attack Prediction)

- Vulnerability Exploitation Prediction;
- Identification of Zero-Day Exploits;
- Social Network Extraction of Malicious Hackers;
- Human-like Spidering;
- Adversarial Reasoning;
- Cascade Prediction.
John Korah

• Assistant Professor, Computer Science

• Research Interests
  • Parallel and Distributed Processing
  • High Performance computing (HPC)
  • Big Data Analytics
  • Computational Social Systems

• Current Research Foci (selected):
  • Data analysis techniques for remote sensing data in precision agriculture.
  • Machine learning techniques for cyber security anomaly detection
  • Models for epidemic spread, diabetes health policy
  • Dynamic information analysis algorithms for multi-core/GPU architectures, cloud computing
John Korah

• Current Openings in Research Group
  • Possibilities for student assistantships

• Contact Information
  • Email: jkorah@cpp.edu
  • WWW: johnkorah.com

• Fall 2020: CS 4990 Special Topics course on Social Computing
  • Social Media Analysis
  • Social networks
  • High Performance Computing Platforms
  • Applications: Epidemiology, recommender systems etc.
Dr. Amar Raheja
Professor, Computer Science
raheja@cpp.edu

Research Interests
• Image Processing
• Computer Vision
• Machin Learning
• Data Visualization

Some Specific Projects
• Develop computer vision software to navigate a driverless golf cart (CATE)
• Improving Eye-Hand Coordination using a Haptic and Gaze device
• Robust control of UAVs using Machine Learning Algorithms
• Plant health and yield determination using UAVs and Machine Learning
• 3D Mapping using LiDAR on UAVs
Plant health prediction using machine learning from hyperspectral data collected by UAVs
(Funding: CA Agricultural Research Initiative)

• Collect data by flying UAVs over plants (lettuce, corn, citrus, strawberry) and train machine learning algorithms to predict vegetation indices using ground truth values measured on ground by handheld devices

• Predict Strawberry yield by identifying strawberries in images using deep learning models

• Identify weeds using machine learning and use UGV to remove them
  • Program a robotic arm mounted on husky robot to pull out weeds identified by the machine learning algorithm (in real time)

• Graduate Research Assistants (1 paid position with stipend for data collection and processing)
Salam Salloum
Fields of Research

Database
Data Mining
Recommender Systems
Software Testing
Algorithm Design
Fault-tolerant Interconnection and Sorting Networks
Other Policies

- **GWT**
  - Eligible to take it upon entrance
  - Required to take it by the semester following the completion of 6 units
  - Do it as early as you can. Don’t wait until the last semester.

- **Continuous enrollment**
  - Cannot be absent for more than two semester (including summer semester)
  - Solution: file leave of absence petition in advance

- **Undergraduate courses as graduate electives**
  - [https://www.cpp.edu/sci/computer-science/current-graduate-students/index.shtml](https://www.cpp.edu/sci/computer-science/current-graduate-students/index.shtml)
Other Policies

- **Minimum GPA (>3.0 avg)**
- **Repetition of courses**
- **Disqualification/Reinstatement**
- **Grad check**
  - Check if you fulfill everything listed on degree contract
  - Degree Progress Report
- **Graduation**
  - Must file an application for graduation
  - Must be enrolled during the semester in which you graduate

Please read “University Graduate Student Handbook” for more Details
https://www.cpp.edu/gradstudies/current-students-page.shtml
Reading Exercise

- CS Current MS Student Handbook
  - https://www.cpp.edu/sci/computer-science/current-graduate-students/index.shtml
- CS MS Forms Collection
  - https://www.cpp.edu/~mihuain/MSCS.html
Questions?