COMP 575: Multi-agent Systems

Fall 2017
Location: Sierra Hall 2432
Lecture Instructor: Jason Isaacs
Email: jason.isaacs@csuci.edu
Web: isaacs.cs.csuci.edu
Phone: (805) 437-8991
Office: BTW 2285
Office Hours (held in SIE 1432): T 1-2 PM and W 4-5 PM

Course Description:

Introduction to the concepts of cooperative control and motion coordination of mobile robots. The course introduces the distributed algorithms used to coordinate robotic networks.

Student Learning Outcomes

By the successful completion of this course, you will be able to:

- Use concepts from graph theory to analyze coordination behaviors from biology.
- Analyze, design, implement, and test distributed algorithms used for robot coordination.
- Use geometric models and optimization to analyze distributed algorithms for mobile robots.
- Perform a literature review of relevant work related to robot coordination.
- Give an oral presentation describing existing research in the field of robot coordination.

Learning Environment:

Each class session will be a blend of lecture and lab. Since the class is three hours long, we will try to break it up in to sections including, lecture to cover new material, student led presentations of relevant literature, and laboratory programming assignments designed to exercise the material covered in lecture.

Grading:

The course grade will be determined by a weighted average of homework assignments, presentations, and a project.

Homework – 20%

- There will be approximately 4 homework assignments during the semester. Questions will be drawn from reading assignments and material discussed in the lecture.

In Class Presentation – 30%

- You will present two research paper to the class (15% each). Since we have a full class we will be presenting up to four people per class meeting. Please use this doodle to sign up: https://doodle.com/poll/448h6p6cvxqh5dwm
- For each presentation, you have the choice of between selecting an appropriate paper related to this course or choosing from a selection of relevant research papers to review.

Final Project – 50%

- The culminating assignment for the class will be an independent research project related to the material from this course.
- 10 points - Prepare a short project proposal by September 18, 2017.
- 25 points - Complete a literature review with at least 5 references by October 9, 2017.
- 25 points - Implement algorithms and run simulations in ROS and/or complete mathematical proofs by November 11, 2017.
- 40 points - Prepare a short write-up of the project (4-6 pages). This should include motivation for the project from the project proposal, a literature review, implementation details, and simulation results. Due date for final report is December 11, 2017 at 9:00 PM.

Letter Grade Determination

Letter Grade	Percentage	Performance
A+	97 -100%	Exceptional Work
A	93 – 96.99%	Excellent Work
A-	90 – 92.99%	Nearly Excellent Work
B+	87 – 89.99%	Very Good Work
B	83 – 86.99%	Good Work

Letter Grade	Percentage	Performance
B-	80 – 82.99%	Mostly Good Work
C+	77 – 79.99%	Above Average Work
C	74 – 76.99%	Average Work
C-	70 – 73.99%	Mostly Average Work
D+	67 – 69.99%	Below Average Work
D	60 – 66.99%	Poor Work
F	0 –59.99%	Failing Work

Instructor Communication Policy:

I will make every effort to respond to your email questions within 24 hours Monday through Friday. If for some reason, you have not received a reply after 24 hours, please feel free to email me again or call my office.

Required Materials:

Textbook Recommended

Title: Distributed Control of Robotic Networks
Authors: Francesco Bullo, Jorge Cortés, and Sonia Martínez
Publisher: Princeton University Press
ISBN-13: 978-0-691-14195-4

Title: Graph Theoretic Methods in Multiagent Networks
Authors: Mehran Mesbahi and Magnus Egerstedt
Publisher: Princeton University Press
ISBN-13: 9781400835355

Course Policies:

Disability Statement

- If you are a student with a disability requesting reasonable accommodations in this course, please visit Disability Accommodations and Support Services (DASS) located on the second

floor of Arroyo Hall, or call 805-437-3331. All requests for reasonable accommodations require registration with DASS in advance of need:https://www.csuci.edu/dass/students/apply-for-services.htm. Faculty, students and DASS will work together regarding classroom accommodations. You are encouraged to discuss approved accommodations with your faculty.

Academic Dishonesty

- By enrolling at CSU Channel Islands, students are responsible for upholding the University's policies and the Student Conduct Code. Academic integrity and scholarship are values of the institution that ensure respect for the academic reputation of the University, students, faculty, and staff. Cheating, plagiarism, unauthorized collaboration with another student, knowingly furnishing false information to the University, buying, selling or stealing any material for an examination, or substituting for another person may be considered violations of the Student Conduct Code (located athttp://www.csuci.edu/campuslife/student-conduct/academic-dishonesty.htm). Please ask about my expectations regarding academic dishonesty in this course if they are unclear.

Course Policies Subject to Change

- It is the student's responsibility to check CILearn for corrections or updates to the syllabus. Any changes will be posted in CILearn.