ASEN 6519 VERIFICATION & CONTROL SANTHESIS FOR STOCHASTIC SYSTEMS SPRING 2023

LECTURE INFORMATION

Tuesdays and Thursdays: 11:30 am - 12:45 pm Room: AERO N240 Video recording will be made available after each lecture on the course canvas page

INSTRUCTOR

Prof. Morteza Lahijanian Office: AES267 Email: <u>Morteza.Lahijanian@colorado.edu</u> Office hour: Thursdays 2-

PREREQUISITES

The course is essentially self-contained, and students are only expected to be familiar with linear algebra, basics of probabilities and difference equations, and graph theory.

Recommended preparation: students should be proficient in linear algebra, basic notions of probabilities and difference equations, and some discrete math (graphs and transition systems). Basic knowledge of controls concepts is helpful but not essential.

GRADING AND EVALUATION

Classwork consists of:

- homework 20%
- tool exercises 10%
- mid-term exam 30%
- paper presentation 10%
- final project 30%

TEXTBOOKS

Required:

• Principles of Model (GTE)

• Temporal logic motion planning and control with probabilistic satisfaction guarantees M. Lahijanian, S B. Andersson, and C. Belta

the <u>classroom behavior</u> policy, the <u>Student Code of Conduct</u>, and the <u>Office of Institutional Equity</u> and <u>Compliance</u>.

REQUIREMENTS FOR COVID-19

As a matter of public health and safety, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements and all public health orders in place to reduce the risk of spreading infectious disease. CU Boulder currently requires COVID-19 vaccination and boosters for all faculty, staff and students. Students, faculty and staff must upload proof of vaccination and boosters or file for an exemption based on medical, ethical or moral grounds through the MyCUHealth portal.

The CU Boulder campus is currently mask-optional. However, if public health conditions change and masks are again required in classrooms, students who fail to adhere to masking requirements

PREFERRED STUDENT NAMES AND PRONOUNS

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

HONOR CODE

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the <u>Honor Code</u>. Violations of the Honor Code may include, but are not limited to: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution (honor@colorado.edu; 303-492-5550). Students found responsible for violating the <u>Honor Code</u> will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Additional information regarding the Honor Code website.

SEXUAL MISCONDUCT, DISCRIMINATION, HARASSMENT AND/OR RELATED RETALLATION

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, protected-class discrimination and harassment, and related retaliation by or against members of our community on- and off-campus. These behaviors harm individuals and our community. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who believe they have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, reporting options, and support resources can be found on the <u>OIEC website</u>.

Please know that faculty and graduate instructors have a responsibility to inform OIEC when they

Lec 11: Markov decision processes (MDPs)

Lec 12

6 2/21-2/23 [nondeterminism + uses, MDP defn, adversaries, measures/min/max, adversary types, end components?]