CALIFORNIA INSTITUTE OF TECHNOLOGY
Control and Dynamical Systems

CDS 101/110
Midterm Exam

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29 October 2014

CDS 101: The exam consists of three questions, worth a total of 40 points. The time limit is 2 hours, in one sitting.

CDS 110: The exam consists of four questions, worth a total of 60 points. The time limit is 3 hours, in one sitting.

The point values for each part are given in square brackets at the beginning of the question. Budget your time to complete as much of the exam as possible and show all of your work. If time does not permit a complete answer, indicate how you would proceed as explicitly as possible.

Please note that students in CDS 101 and CDS 110 are required to answer different sets of questions (or portions of questions), depending on which course you are taking. Please be careful to answer only the questions for the course you are taking. No additional credit will be given for solutions provided to questions that are not for the course you are taking.

> The exam is due by 5 p.m. Tuesday, 4 November. Please hand your exam in to Nikki Fauntleroy in 107 Steele; if Nikki is not in the office you may turn your exam into the usual box outside 102 Steele.

The exam is open book. You may use the course textbook (Åström and Murray), course handouts, lecture and class notes, course problem sets and solutions, and *your own* handwritten notes. No other books are allowed.

You may use a computer or calculator for carrying out *numerical* computations. Matlab or Python may be used but are not required. Symbolic computations (e.g. using Mathematica or Matlab/Maple) are not allowed. All of your answers must be hand written or hand drawn (do not turn in code or computer plots).

You are not allowed to use the Internet during the exam, except for accessing local computing resources, such as Matlab, or material posted on the course web site (within the caltech.edu domain).

Please write your solutions in a fresh exam book (blue book). We have to grade a large collections of exams in a short time and it makes things much simpler to manage if everyone uses a blue book.