



A. JAMES CLARK SCHOOL OF ENGINEERING

Course: ENPM667 – Control of Robotic Systems

Instructor: Waseem A. Malik

Phone: 240-228-2813

Email: waseem.malik@jhuapl.edu

Course Description

This is a basic course on the design of controllers for robotic systems. The course starts with mainstay principles of linear control, including a review of elementary concepts of systems, and discusses applications to independent joint control. The second part of the course introduces a physics-based approach to control design that uses energy and optimization principles to tackle the design of controllers that exploit the underlying dynamics of robotic systems. The course ends with an introduction to force control and basic principles of geometric control if time permits.

Textbook(s)

Robot Modeling and Control

Mark Spong, Seth Hutchinson, and M. Vidyasagar

Wiley; 1st edition (November 18, 2005)

ISBN: 0471649902

Required

Course Outline

- An overview of robotic systems and control systems
- Basic concepts of linear system theory, with applications and numerical methods
- Modeling and design of linear controllers using state-space methods
- Analysis and design of feedback systems using frequency domain methods (PI, PD, and PID)
- Modeling and control design of mobile platforms
- Introduction to modeling and control design of manipulators (Independent joint control)
- Multivariable control of manipulators
- Force Control (if time permits)

Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit <http://shc.umd.edu/SHC/HonorPledgeInformation.aspx>.