



MENG 5308 – Robotic Vision and Control

Course Syllabus

Semester / Year	Spring 2024
Catalog Description	This course focuses on the application of machine vision learning in application to robotics, such as the vision-guided control in arm-type robots. A software package will be selected for use a learning support tool. The course includes a design project and computer programming as a major component.
Prerequisites	Graduate Status.
Section Number	001
Instructor Name	Dr. Chung Hyun Goh
Contact Information	Email: cgoh@uttyler.edu Phone: 903-566-6125 Office: RBN 3007
Class Type / Instruction Mode / Location	001: Face-to-face / Lecture / RBN 3039,
Class Time	Th 5:00 PM – 7:45 PM
Office Hours	M/Tu/W 10:00 AM – 11:00 AM or by appointment
No. of Credits	3 credits (Lecture)
Required Textbook	Robotics, Vision and Control: Fundamental Algorithm in MATLAB – Peter Corke. 2 nd Ed., 2016, Springer
Optional References	Computer & Machine Vision: Theory, Algorithms, and Practicalities – E. R. Davies, 4 th Ed., 2012, AP (Academic Press)
Additional Rules and Requirements	Programming skills with MATLAB / Simulink or Python (or other computer languages)
Evaluation Method	AI Ethics Debate 10% Final Project Report / Presentations 30% Mid-term Exam 20% Homework 15%, Quizzes 15% Course Participation 10% (In-Class Examples, Assign submissions, etc.)
Grading Policy / Scale	Letter grades, scale: A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60
Important Events / Dates	Census date: 01/29/2024 First drop for non-payment: 01/24/2024 Exam date: Mid-term (March 7, 2024) Last date to withdraw from one or more 15-week courses: 03/25/2024 Final project presentation date: 04/25/2024
Attendance / Makeup	Regular attendance is imperative if you want to do well in this course. Therefore, regular attendance is highly recommended. In case you have to miss a class, it is your



policy / other rules	responsibility to keep up with the class work and be informed of all announcements made in the class on HomeWorks, tests etc. No makeup exams will be authorized without providing an official document showing that your absence is in line with university rules.
Course Learning Objectives / ABET & PEOs Relation	By the end of this course, students will be able to: <ol style="list-style-type: none">1. Demonstrate an understanding of basic knowledge for position and orientation representation and navigation process in robotics.2. Apply machine vision and robot learning techniques to analyze forward and inverse kinematics in arm-type robots.3. Utilize computer programming using MATLAB to perform vision-guided motion control in robotics.4. Demonstrate the ability to be an effective team member on a group project to apply robot vision concepts for real-world problems.5. Conduct a major project leading to a draft of a publishable level paper.
Tentative Topics / Course Plans	<ol style="list-style-type: none">1. Representation of position and orientation in robotics2. Navigation and localization in robotics3. Robot arm kinematics4. Image formation, processing, and feature extraction in machine vision5. Embedded robotics6. AI ethics and AI in robotics
University Policies	https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf