Course Overview
Automation and Robotics

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Instructor

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Course Overview

https://www.youtube.com/watch?v=niSDYbhTZAU

Grading

- Assignment 15%
- Presentation 10%
- Lab 15%
- Project 45%
  - Stationary robot competition 15%
  - Mobile robot competition 15%
  - Emotional robot presentation 15%
- Teamwork 15%
  - Peer review + TA review

Attendance rules

- Students can be absent twice without any reason.
- After two absences, students will lose 4 points of the semester grade each time they are absent.
- Late in 30 minutes = 1/4 absence
- Late over 30 minutes = 1/2 absence

Assignment (15%)

- What?
  - You have to read the assigned journal paper and answer the questions before each class.
- Purpose?
  - Acquire the ability of reading a professional report.
- Grading?
  - Answer the questions with some additional related contents(V+), without any misunderstandings(V), with some misunderstandings(V-).

Assignment (15%)

- Example:

Automation in Construction 19 (2010) 286–290

Contents lists available at ScienceDirect

Automation in Construction

journal homepage: www.elsevier.com/locate/autcon

Review

Automation and robotics in construction: International research and achievements

Edmundas Kazimieras Zavadskas

Vilnius Gediminas Technical University, Lithuania

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ABSTRACT

An overview of the results of the 25th anniversary International Symposium on Automation and Robotics in Construction (ISARC-2008), held for first time in Lithuania, is presented in this article. Also, for the first time, the Symposium was organized in joint with the International Council for Research and Innovation in Building and Construction (CIB). This article is a survey of the plenary session presentations. Further it surveys the articles in the new-published Special Issue based on the proceedings papers from ISARC-2008 as well as the ones published in different scientific journals.

Contents

The 25th anniversary of the International Symposium on Automation and Robotics in Construction (ISARC-2008) was organized by the International Association for Automation and Robotics in Construction (IAARC), Institute of Internet and Intelligent Technologies of Vilnius Gediminas Technical University, International Council for Research and Innovation in Building and Construction (acronym CIB), Lithuanian Academy of Sciences, Russian Academy of Engineering and International Academy of Engineering. What made the anniversary of this Symposium truly exceptional was that CIB joined the team of institutional organizers. This new cooperation instigated consideration for establishing a joint IAARC and CIB task force. The 25th ISARC-2008 invited researchers, academics and practitioners interested in the use of information and computational, intelligent, biometric and robotic technology in design, construction, maintenance and facilities management of the built and human environment to join forces with the IAARC and CIB in the pursuit of excellence regarding these technologies. The ISARC-2008 included a plenary session with keynote presentations and three parallel technical tracks.

The presentations read during the plenary session were by M. J. Skibniewski [1], the 2007 laureate of the Richard L. Tucker–Yukio Hasegawa Award, H. Adeli [2], T. Bock [3], D. Cygas, A. Laurinavicius, A. Vaitkus, V. Puodziukas [4], R. Nawon [5], E. Uspuras, S. Rimkevicius, A. Kaliatka [6], E. K. Zavadskas and A. Kaklauskas [7], Carl Haas, Moon-Young Cho, Wim Bakens.

M. J. Skibniewski read the 2007 Tucker–Hasegawa award lecture [1] pointing out that intelligent building and construction automation has been, in one form or another, instrumental for decades and yielding many benefits. Most notably Intelligent Building Automation Systems can have a direct effect on the energy profile of a building. This author has attended all but two of the annual proceedings of the International Symposia on Automation and Robotics in Construction, held annually throughout the world since 1984. The evolution of construction and building automation concepts leads him to believe that the time has come to unify the various automation and robotic technology concepts presented at these symposia and to employ them in the service of designing and producing optimized buildings

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Automation and Robotics

Reading Assignment # 0 1

Due : Sep 18 2013 14:20

Assigned Reading

1. E. K. Zavadskas, "Automation and robotics in construction: International research and achievements," *Automation in Construction,* vol.19, pp. 286-290, 2010.

Description

Please read the assigned reading and answer the following questions. The answers need to be clear and straight to the point. Each answer can be a short paragraph but should be limited within 300 words and one page (including figures). If you refer any material other than this assigned reading, please cite the reference as a footnote. Please print the hard copy and bring it to the class.

Questions

1. Please introduce the automation and robotics proposed in the presented paper briefly.
2. How did automation and robotics help in construction?
3. Please write down a question to discuss in the class.

Presentation (10%)

- What?
  - As a team, you all have to make a 20 minute presentation for one of the assigned papers.
  - You must discuss the content with TA at least one week before the presentation date.
  - The presenters need to prepare several questions and lead a short discussion.
- Purpose?
  - Ability to summarize an article and describe it to others.

Presentation (10%)

- Grading? (with V+, V, V-)
  - Organization
  - Visual clarity
  - Time control

Presentation (10%)

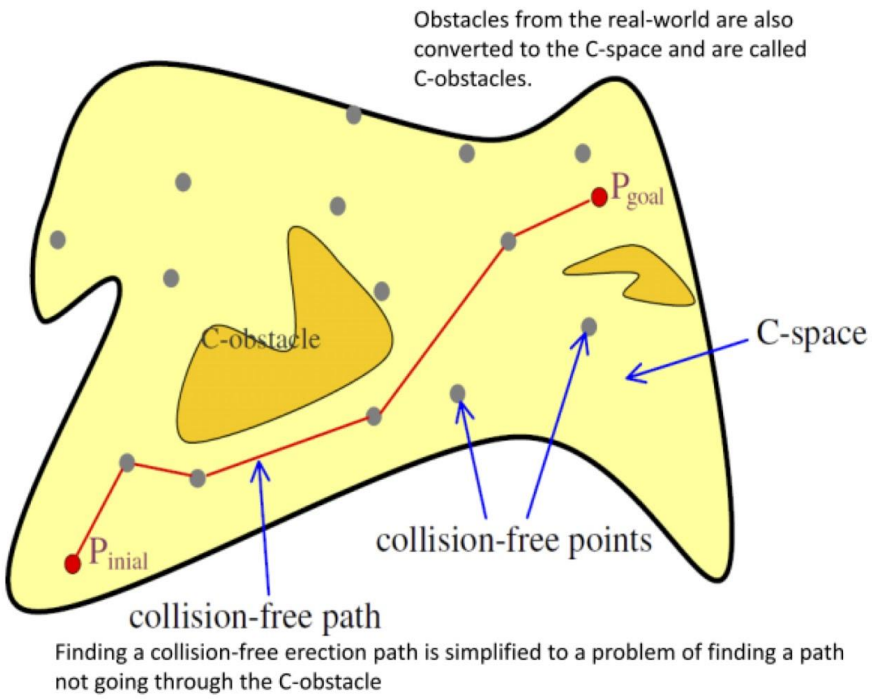
- Example:

Authors /
ShihChung Kang
Eduardo Miranda

Presenter /
Ray Wen

Planning and visualization for automated robotic crane erection processes in construction

Automation in Construction 15 (2006) 398 – 414



Finding a collision-free erection path is simplified to a problem of finding a path not going through the C-obstacle

Teamwork (15%)

- What?
  - Your team have to work together for a presentation, in-class excercises and three projects.
- Purpose?
  - Be active, supportive, and a part of a mutual learning team.
- Grading?
  - Peer review + TA review

    (after accomplishing each project)

Teamwork (15%)

- Example: Once upon a time, there was a person who was often late and always forgot to bring something the team needed. Unfortunately, he/she refused to collaborate with other teammates.

- In this case, what can you do?

Teamwork (15%)

- Rate yourself and your teammate in three aspects.

	Myself	Teammate 2	Teammate 3	Teammate 4
Active				
Supportive				
How much did you learn from your teammate?				

Teamwork (15%)

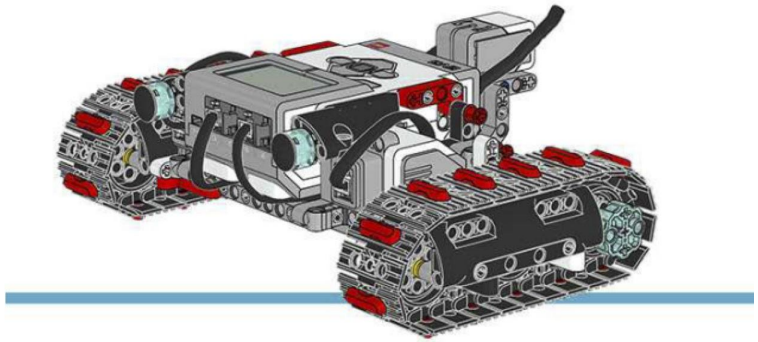
- Penalty card
  - Yellow card: you can disucuss with your teammates and show a yellow card to a particular person in your team as a caution.
  - **Red card**: The particular person will get one red card after already collectting TWO yellow cards, and the instructor will privately talk to him/her to let him/her know his/her situation.

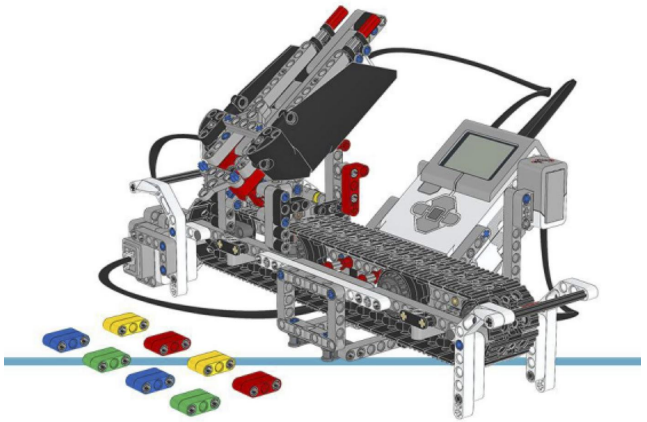
Lab (15%)

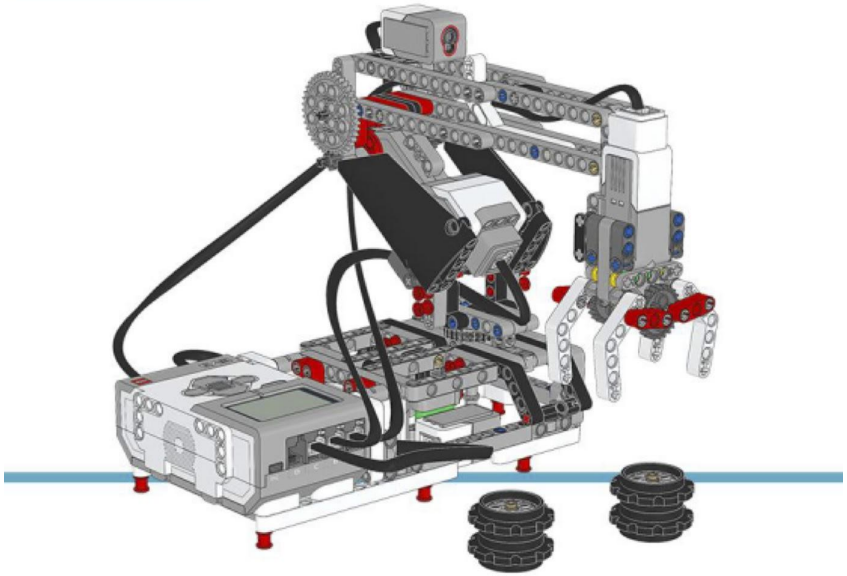
- What?
  - A lab course will follow behind a lecture course.
- Purpose?
  - To improve your hands-on skills.
- Grading?
  - V+ : achieve the goal and help other teams.
  - V : achieve the goal.
  - V- : achieve the goal with some flaws.

Lab (15%)

- Example:







Project (45%)

- What?
  - Stationary robot competition 15%
  - Mobile robot competition 15%
  - Emotional robot presentation 15%
- Purpose?
  - To solve three complex problems.
- Grading?
  - To be announced in each project description.

Project (45%)

- Example: https://www.youtube.com/watch?v=rnnyWyKv3rA

Schedule

	Date	Topic	Assignment
	09/14	Course Overview	
Module I: Stationary Robot	09/21	Lab 1-1: Color Sorter	
	09/28	Lab 1-2: Robot Arm	Control of fast crane operation
	10/05	Project 1 Announcement	Development of user interface for tele-operated cranes
	10/12	Project 1 pre competition	
	10/19	Special Talk（Speaker: prof. 張家銘）	

Schedule

Module II: Mobile Robot	10/26	Project 1 final competition	
	11/02	Lab 2-1: Tank Bot	Robotic Assembly System for Steel Structure
	11/09	Lab 2-2: Forklift	PI-bot: a real-time autonomous pavement distress survey robot
	11/16	Project 2 Announcement	Security Robot Simulator
	11/23	Project 2 pre competition	
	11/30	Project 2 final competition	

Schedule

Module III: Human Interactive Robot	12/07	Lab 3-1: Gyro Boy	A Lightweight Bridge Inspection System Using a Dual-cable Suspension Mechanism
	12/14	Lab 3-2: Remote Control	Autonomous drilling robot for landslide monitoring and consolidation
	12/21	Project 3 Announcement	A performance evaluation of a Stewart platform based Hume concrete pipe manipulator
	12/28	Project 3 Presentation	
	01/04	Buffer class	
	01/11	Week of Final Exam (No Class)	

Thank You

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陳鵬元 pychen@caece.net

Course website:
http://nturlab.weebly.com/automation-and-robotics.html