Smart Mobility Engineering Lab (IGS3231)

Jump Together, Fly Farther!

School of Global Convergence Studies

인하대학교 국제학부

Week 1 Lecture

ISE Department

Prof. Mehdi Pirahandeh

Content

- Welcome to Class
- Introduction to Smart Mobility Engineering Lab
- Q & A
- Survey

Professor Profile

Education

- Boras University, Sweden, Bachelor Degree in Computer and System Science
- Inha University, Integrated Master and PhD in Electronic Eng.

Experience

- Inha University, Research Professor in Big data and Intelligent Embedded system
- Inha University in Tashkent, Teaching Professor
- Inha University, Electronic Eng. Dep. , Invited Professor
- Rep. of Korea National Research Foundation, Creative Research Principal Investigator
- Inha University, ISE Dep. , Assistant Professor

- Office Hour: Book an appointment via email.
- mehdi@inha.ac.kr

Introduction

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- This course consists of multiple guided tutorials and lab sessions with increasing difficulty levels when working with an autonomous robot and machine learning.

- You learn how to set up such a TurtleBot3 from scratch using ROS/ROS2, how to interface the individual sensors and actuators, and finally, how to implement the practical projects.

- This course provides students with hands-on lab experience applying Ai and robot programming techniques for implementing the final autonomous robot projects.

Course Goals

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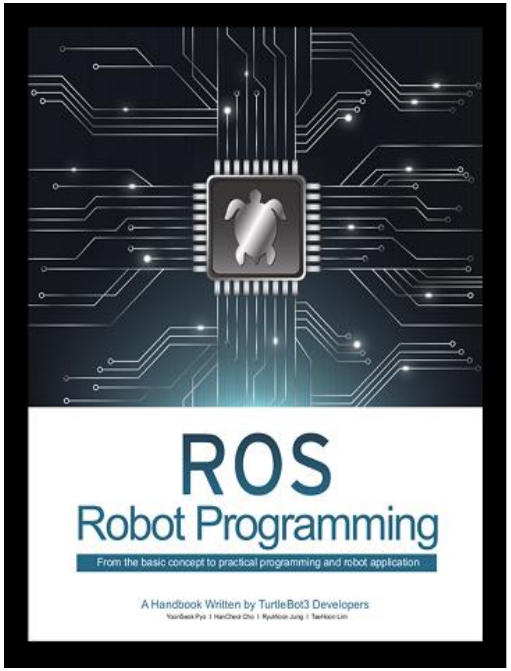
- By participating in this course attendees will learn how to:

  - Practice ROS/ROS2 python/C++ client library: Creating your own ROS/2 C++/Python programs
  - Practice the recent simulating tool with ROS: RVIZ, RQT, Gazebo simulator
  - Familiarize the student with the recent machine learning project with ROS/ROS2
  - Familiarize the student with the recent Autonomous Vehicle project with ROS/ROS2

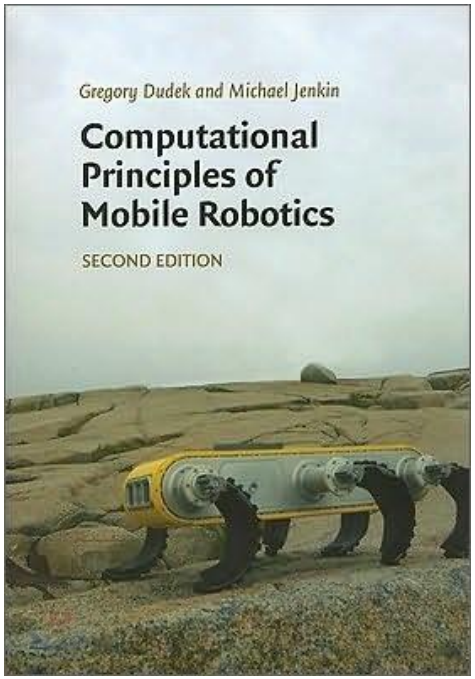
Course Oulines

- This course structure is outlined as follows,
  - I will notify the detailed class information in GitHub Repository, I-class system, and dedicated Kakao Group.
  - The student will present their projects and I will provide them with multiple feedback.
  - Blended Lecture and practice will be provided for students using a mix of offline classes, video content and online Zoom sessions.
  - There will be multiple tutoring sessions for helping students.

Books


ROS
Robot Programming
From the basic concept to practical programming and robot application
A Handbook Written by TurtleBot3 Developers

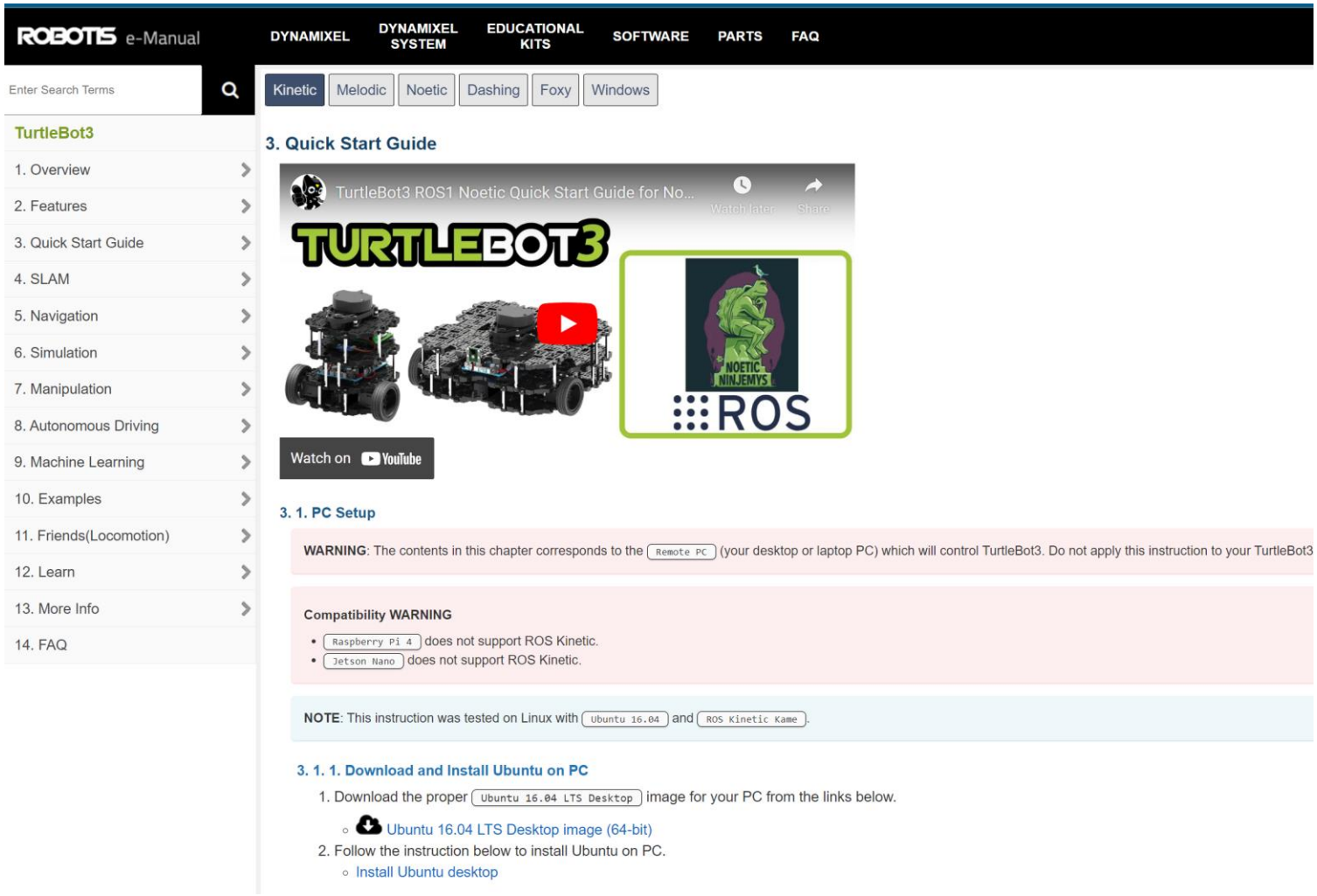

TURTLEBOT3
Burger


Gregory Dudek and Michael Jenkin
Computational Principles of Mobile Robotics
SECOND EDITION

Course Evaluation

Syllabus

Introduction to Course



https://emanual.robotis.com/docs/en/platform/turtlebot3/quick-start

Introduction to Course

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ROS 2 Documentation: Foxy

Search docs

- Installation
- Distributions
- Tutorials
- How-to Guides
- Concepts
- Contact
- The ROS 2 Project
- Related Projects
- Glossary
- Citations

» ROS 2 Documentation Edit on GitHub

You're reading the documentation for an older, but still supported, version of ROS 2. For information on the latest version, please have a look at Humble.

ROS 2 Documentation

The Robot Operating System (ROS) is a set of software libraries and tools for building robot applications. From drivers and state-of-the-art algorithms to powerful developer tools, ROS has the open source tools you need for your next robotics project.

Since ROS was started in 2007, a lot has changed in the robotics and ROS community. The goal of the ROS 2 project is to adapt to these changes, leveraging what is great about ROS 1 and improving what isn't.

This site contains the documentation for ROS 2. If you are looking for ROS 1 documentation, check out the ROS wiki.

If you use ROS 2 in your work, please see Citations to cite ROS 2.

Getting started

- Installation
  - Instructions to set up ROS 2 for the first time
- Tutorials
  - The best place to start for new users!
  - Hands-on sample projects that help you build a progression of necessary skills
- How-to Guides

http://docs.ros.org/en/foxy/index.html

Brief break (if on schedule)

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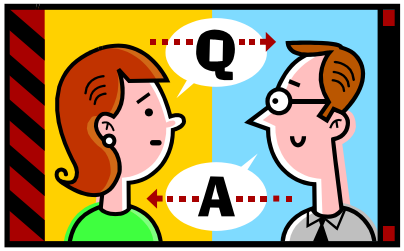
Q&A?



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