

CS 309: Autonomous Intelligent Robotics

FRI I

Lecture 13:

Remote Procedure Call & ROS Services Part 2

Intro to Computer Vision

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http://justinhart.net/teaching/2018_spring_cs309/

A couple of quick notes

- Homework 2: Is due tonight.
 - PDDL
 - Questions on the homework build on each other.
 - You could, in theory, use only one domain file for the entire assignment
 - But multiple fact files
 - Any questions?
- Homework 3
 - Will go out tomorrow
 - Due March 8

Topics & Services (Recap)

- Both connect through roscore
- Both use callbacks
- `ros::init()`
 - Sets up ROS
- `ros::NodeHandle`
 - Connection to roscore

Topics & Services (Recap)

- Topics
 - Publish/Subscribe
 - advertise()
 - publish()
 - subscribe()
- Services
 - Remote Procedure Call
 - advertiseService()
 - call()

ROS Message Formats

- Topics look kind of like this
string a
int64 b
- Services look kind of like this
int64 a
int64 b

string retVal

Cmakelists.txt & package.xml

- Cmakelists.txt
 - Gives you how to build the software. Works with `catkin_make` or `catkin build`
- package.xml
 - Package manifest, tells ROS and catkin what to do with your software
- If you run `catkin_create_pkg` it gives you a template that you can just fill in!

Putting it all together

- Let's compute Fibonacci numbers with ROS topics and services!

OpenCV

- Open Computer Vision System
 - Officially launched in 1999 at Intel Research
 - Original purpose, studying CPU-intensive applications
 - Development was partially hosted at Willow Garage, and Willow Garage adopted OpenCV and Point Cloud Library
 - Open source
 - BSD license
 - Now run by OpenCV.org

OpenCV

- Includes many basic vision primitives
 - We will explore a few of the basics
 - Color channel filtering
 - Blob detection
- Supports 2D and 3D vision
- Has advanced features for stereo vision, structure from motion, face recognition, motion tracking and many many modern vision features

OpenCV

- Today, we will do some simple color filtering