

The  
**Construct**  
Learn and develop for robots

W E B I N A R

# HOW TO TEACH YOUR INTERNS IN ROS... FAST!

Ricardo Téllez | CEO of The Construct

NOVEMBER 30<sup>TH</sup>, 2017

[WWW.THECONSTRUCTSIM.COM](http://WWW.THECONSTRUCTSIM.COM)

# S P E A K E R

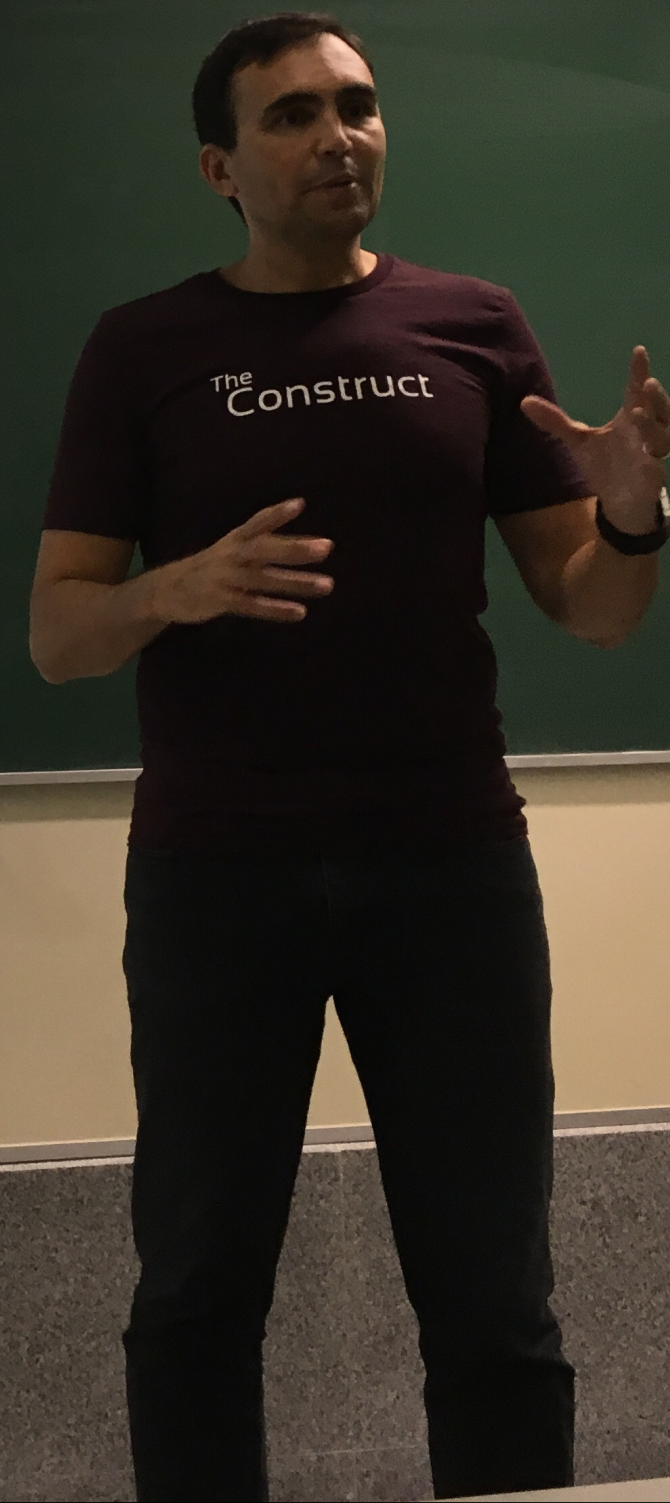
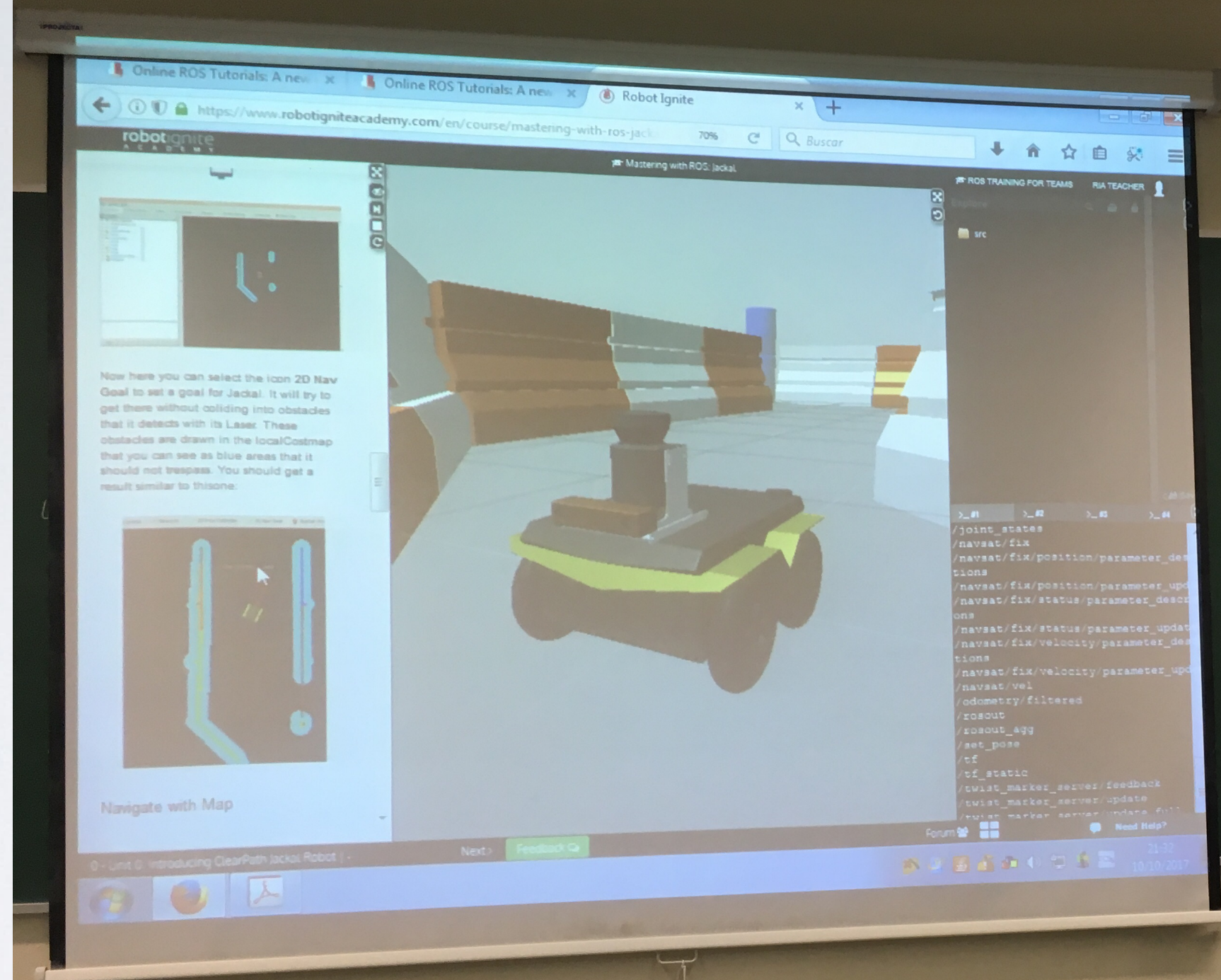
**Ricardo Téllez, PhD**  
CEO of The Construct

*"Developing the tool that will  
make robots understand their world"*

 [linkedin.com/in/ricardotellez](https://www.linkedin.com/in/ricardotellez)



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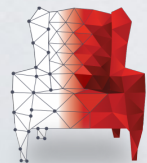
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# STAY WITH ME UNTIL THE END!

Instructions for getting:

SLIDES  
+  
WHITE PAPER

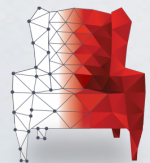
at the end of the webinar

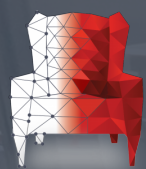


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# I N D E X

- Typical training and setup
- The interns situation
- How to learn fast
- Demo + Questions

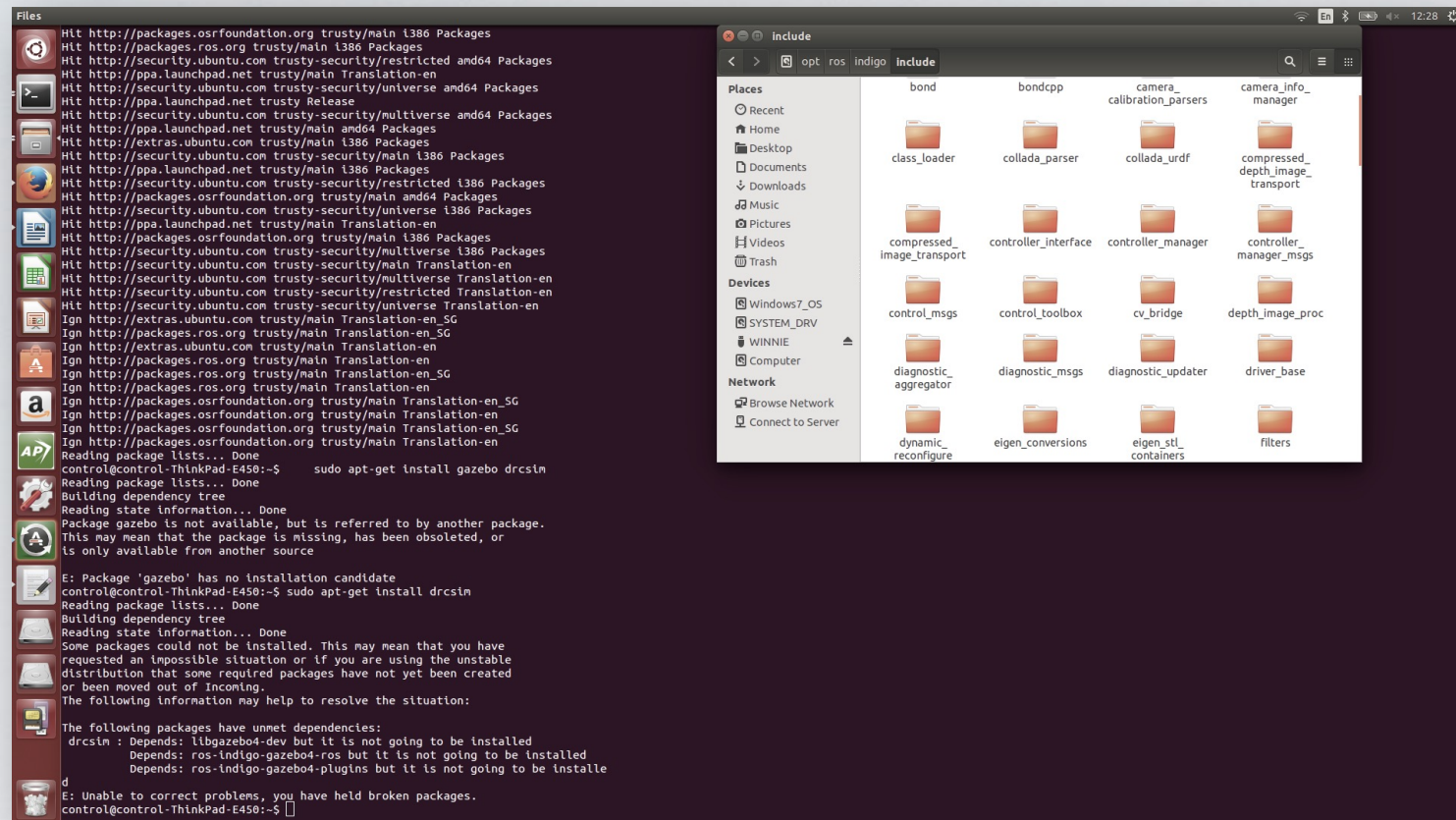




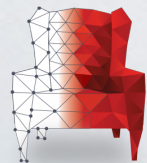
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# LEARN ROS **TIPICAL TRAINING**

# TYPICAL TRAINING



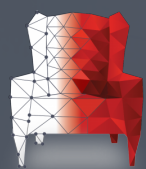
- Install ROS + Gazebo
- Go to wiki tutorials



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- It works
- It is completely inefficient

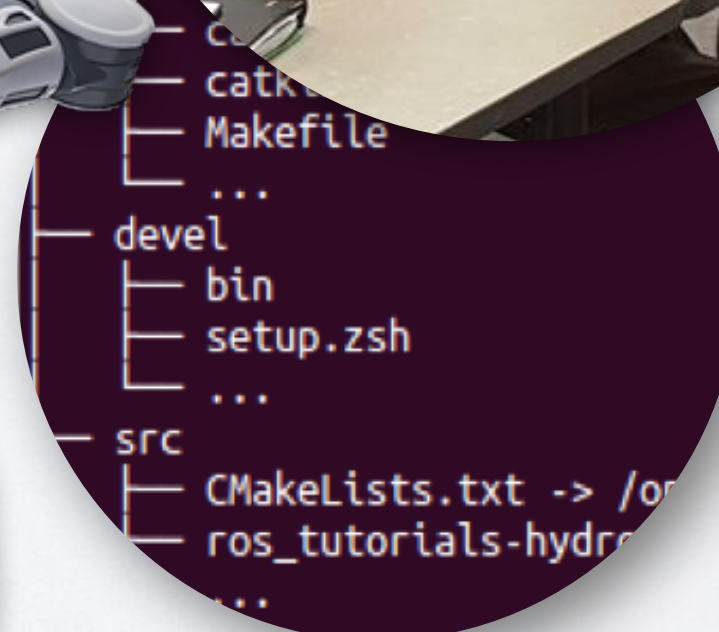
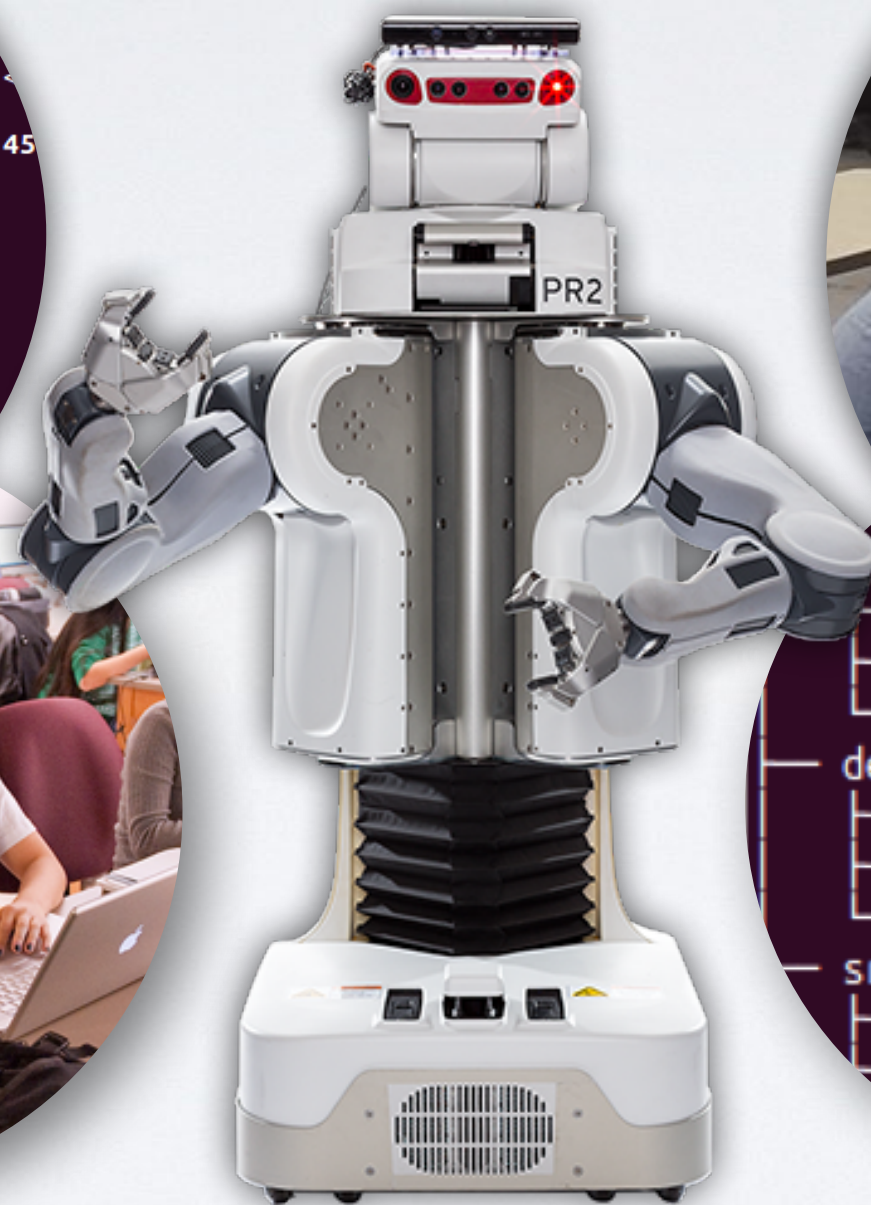
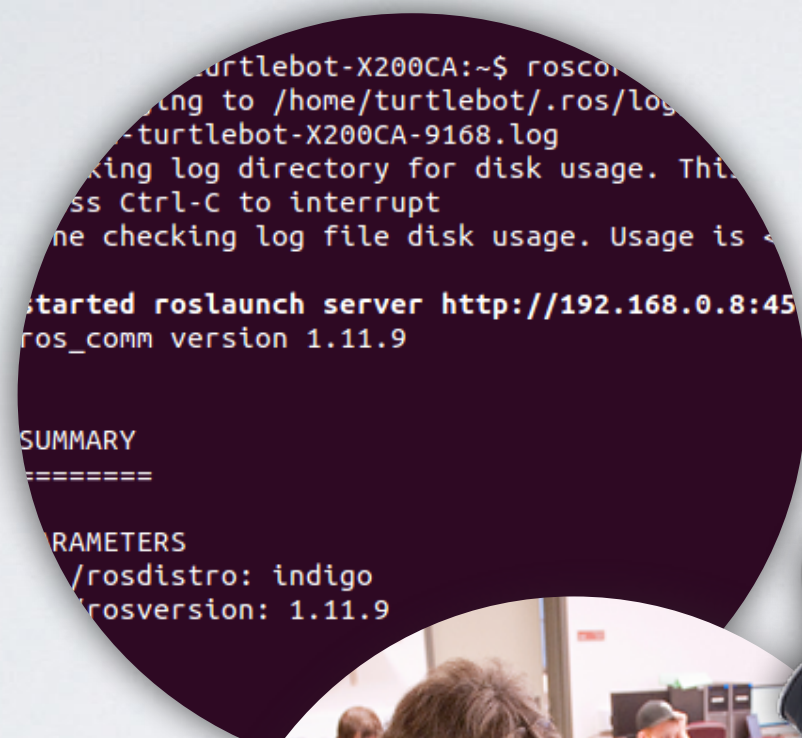




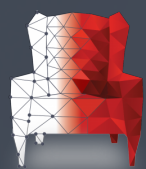
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# LEARN ROS **TIPICAL LAB SETUP**

# TYPICAL LAB SETUP

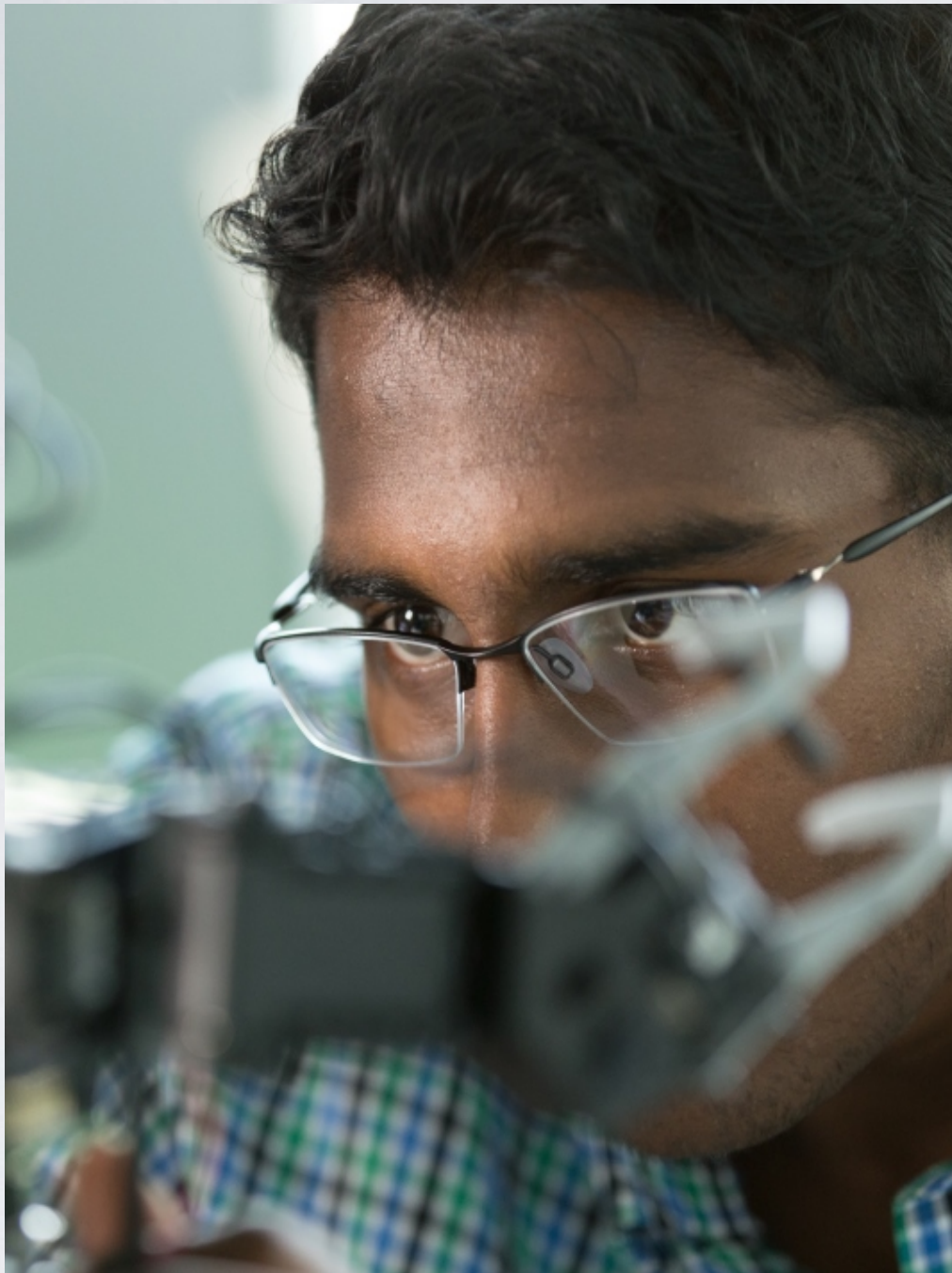


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# LEARN ROS **THE INTERNS**

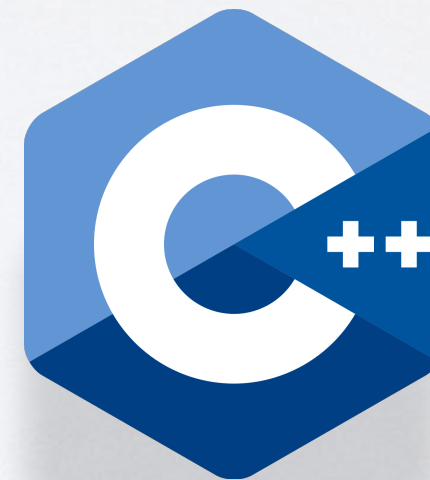
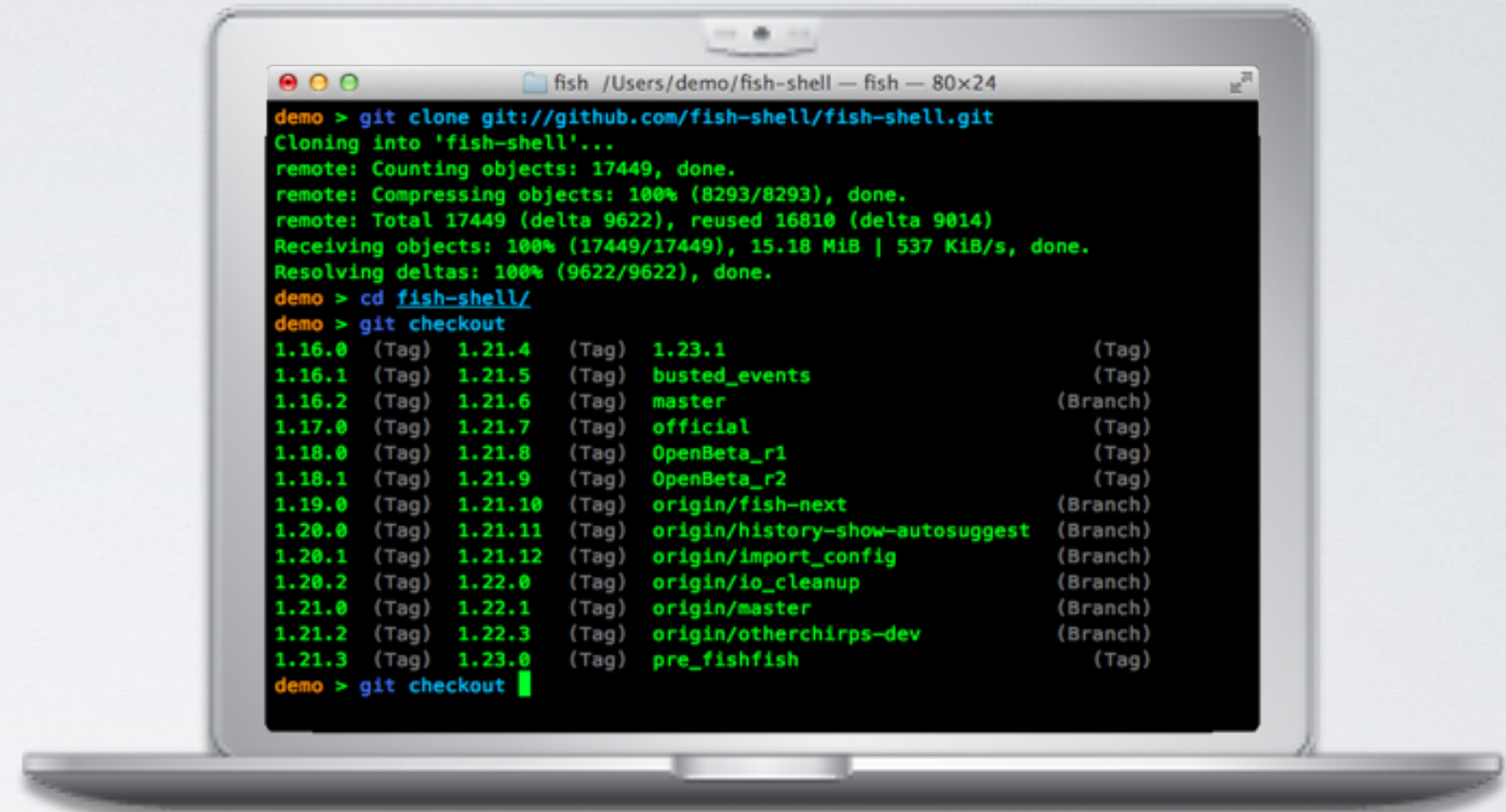


- May have no knowledge of Linux, C++ or Python
- Has no knowledge of ROS
- Has no knowledge of your packages
- Has no knowledge of your robot
- Has no knowledge of robots simulations



Required subjects to master

- Linux Shell, C++ or Python

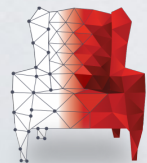
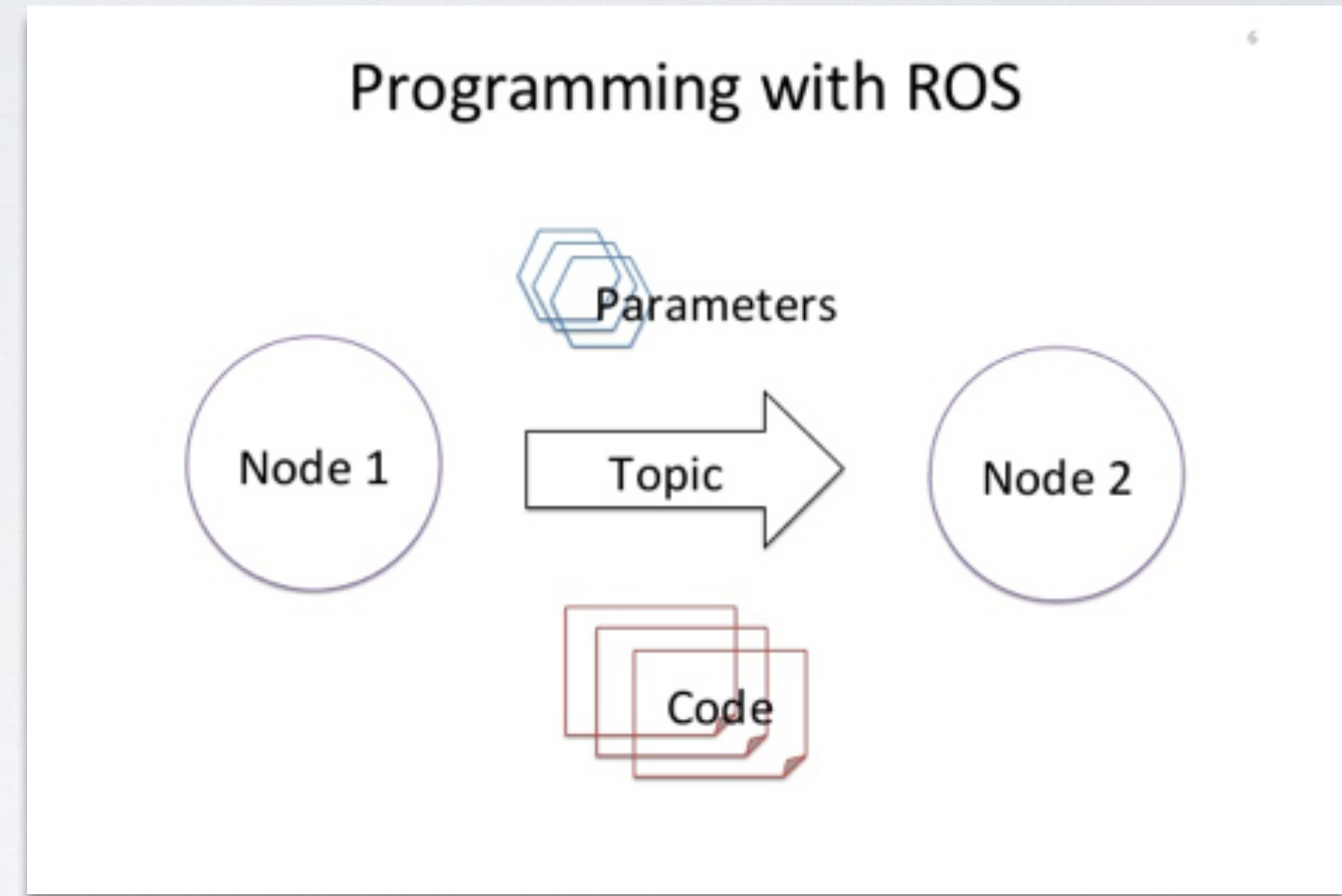


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Required subjects to master

- Linux Shell, C++ or Python
- ROS Basics

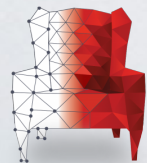
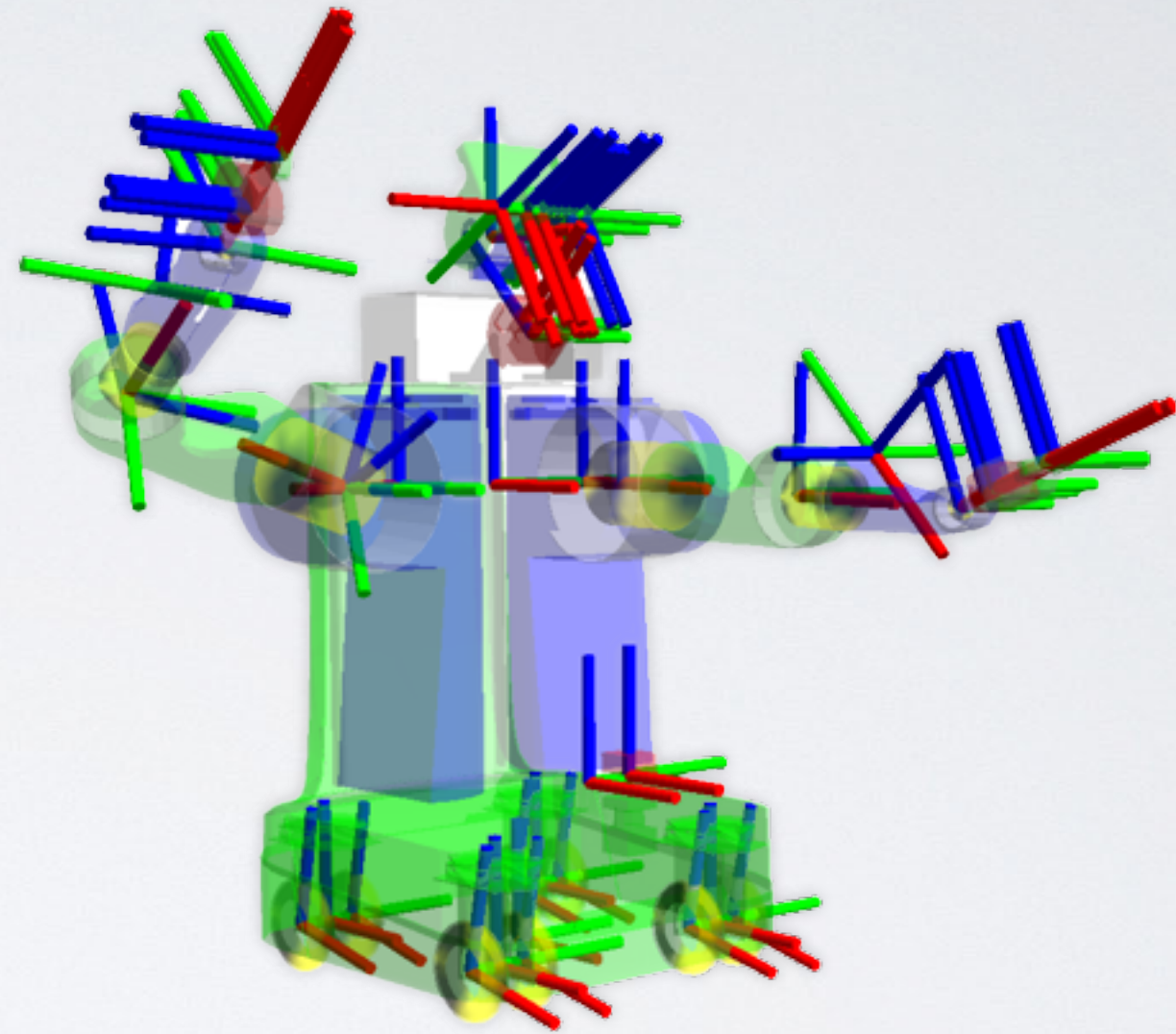


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Required subjects to master

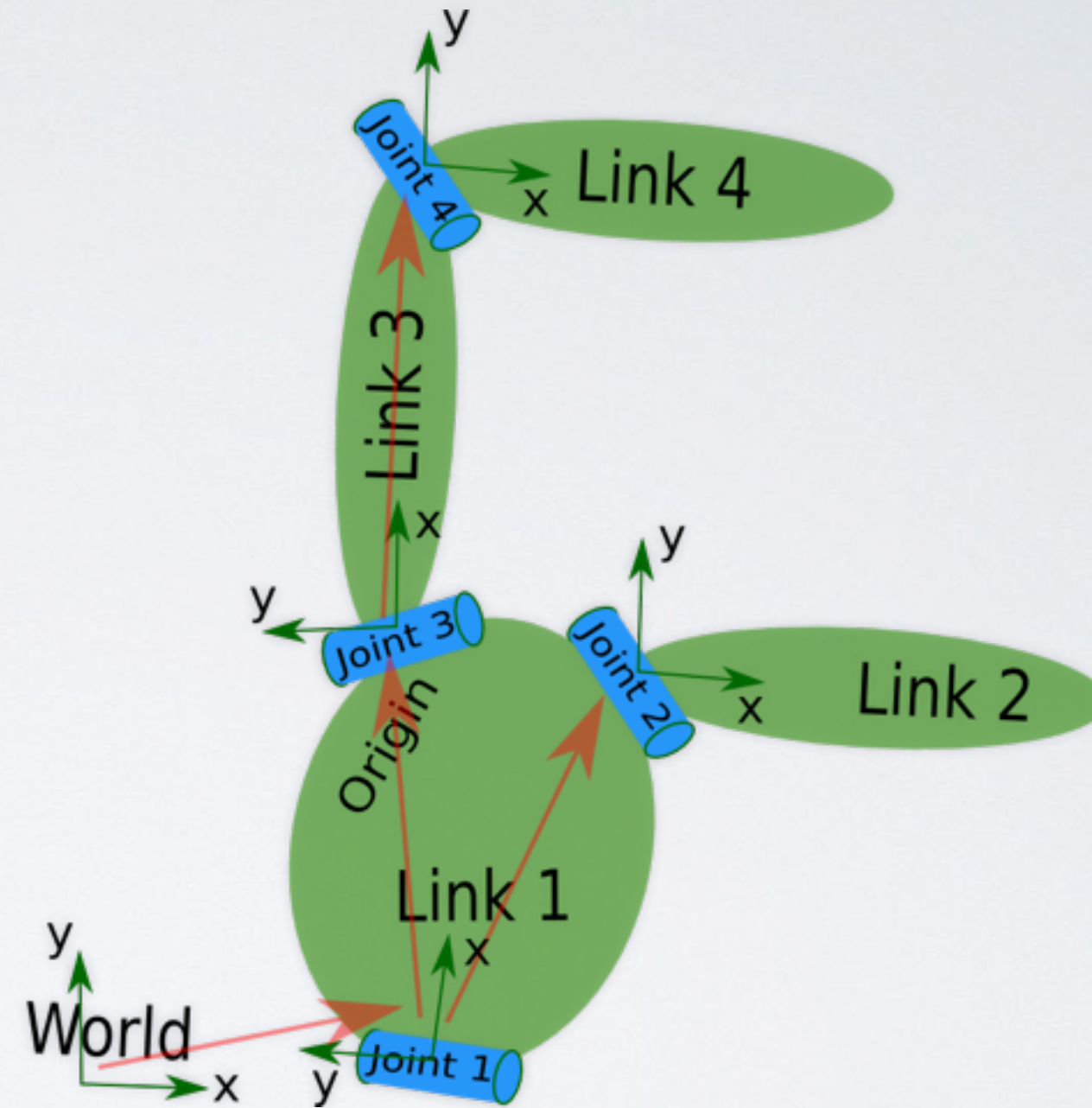
- Linux Shell, C++ or Python
- ROS Basics
- ROS TF



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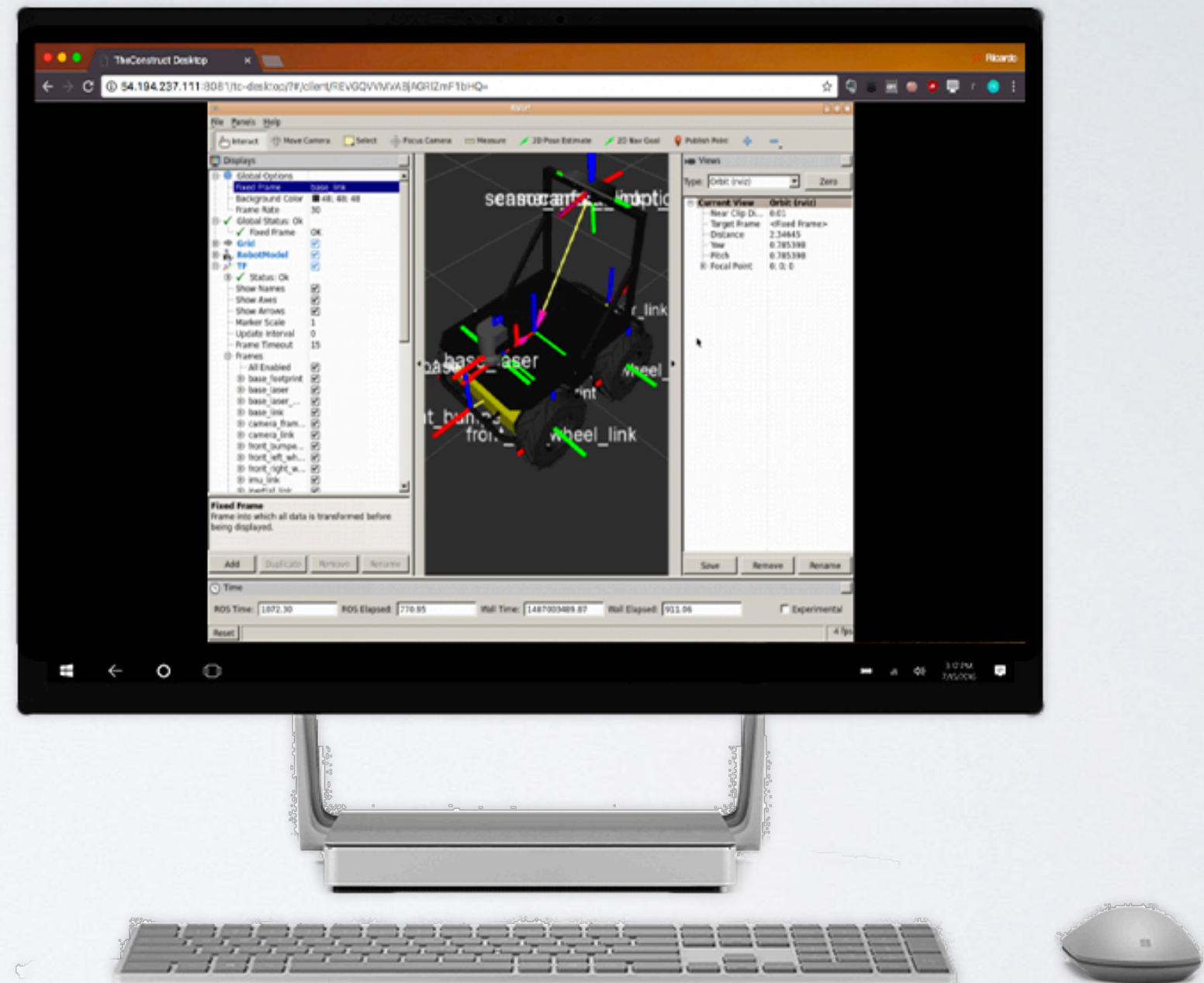
Required subjects to master

- Linux Shell, C++ or Python
- ROS Basics
- ROS TF
- ROS URDF



Required subjects to master

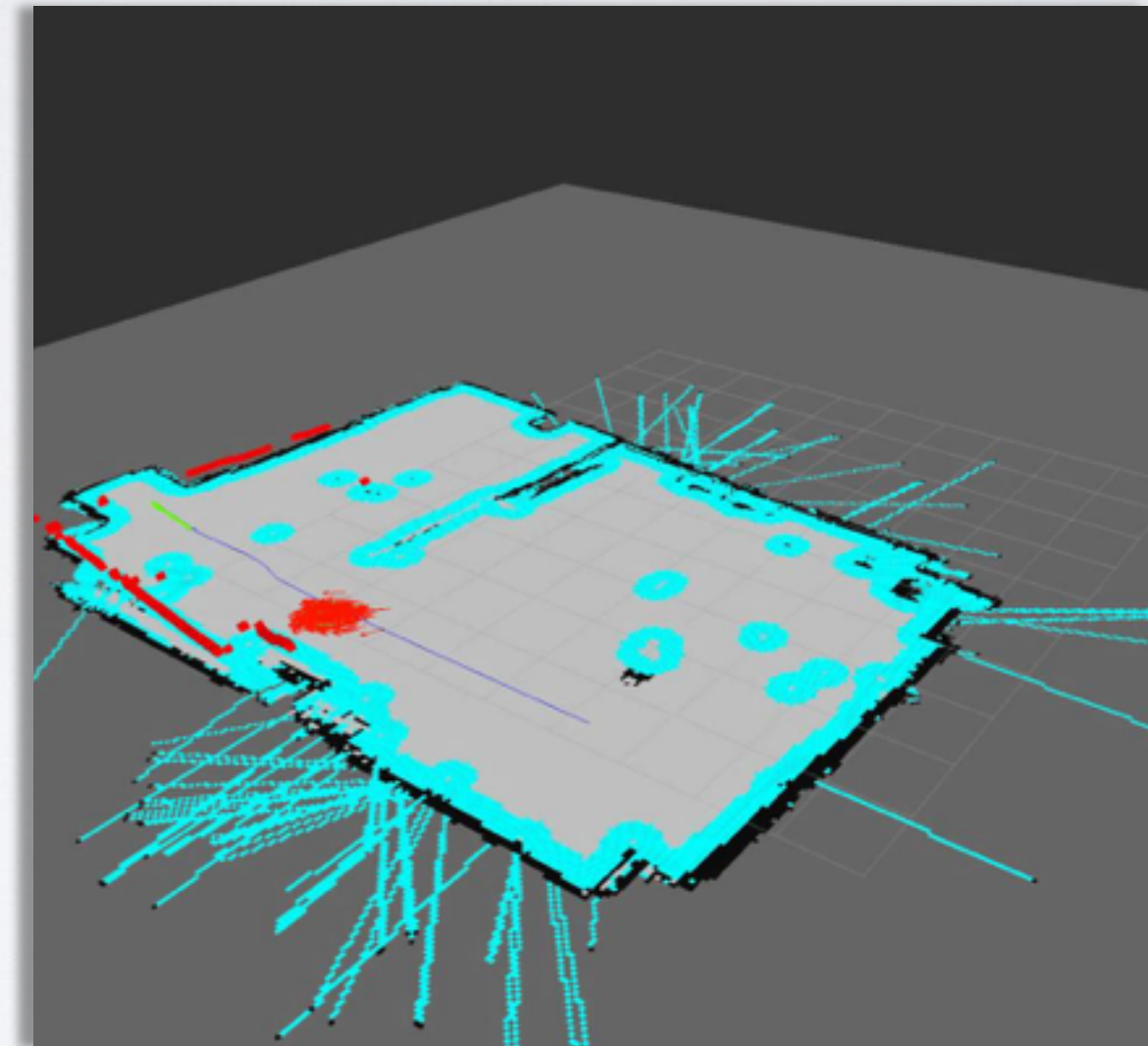
- Linux Shell, C++ or Python
- ROS Basics
- ROS TF
- ROS URDF
- ROS Debugging





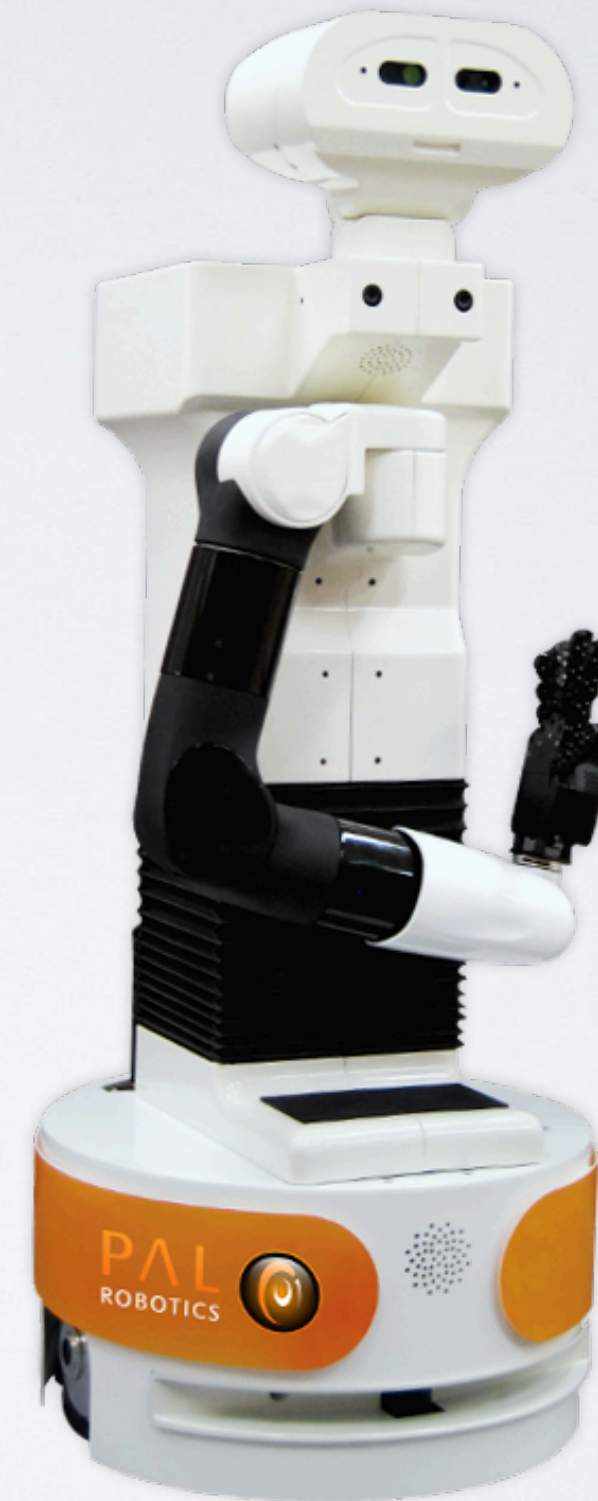
## Required subjects to master

- Linux Shell, C++ or Python
- ROS Basics
- ROS TF
- ROS URDF
- ROS Debugging
- ROS Navigation, Perception and Manipulation

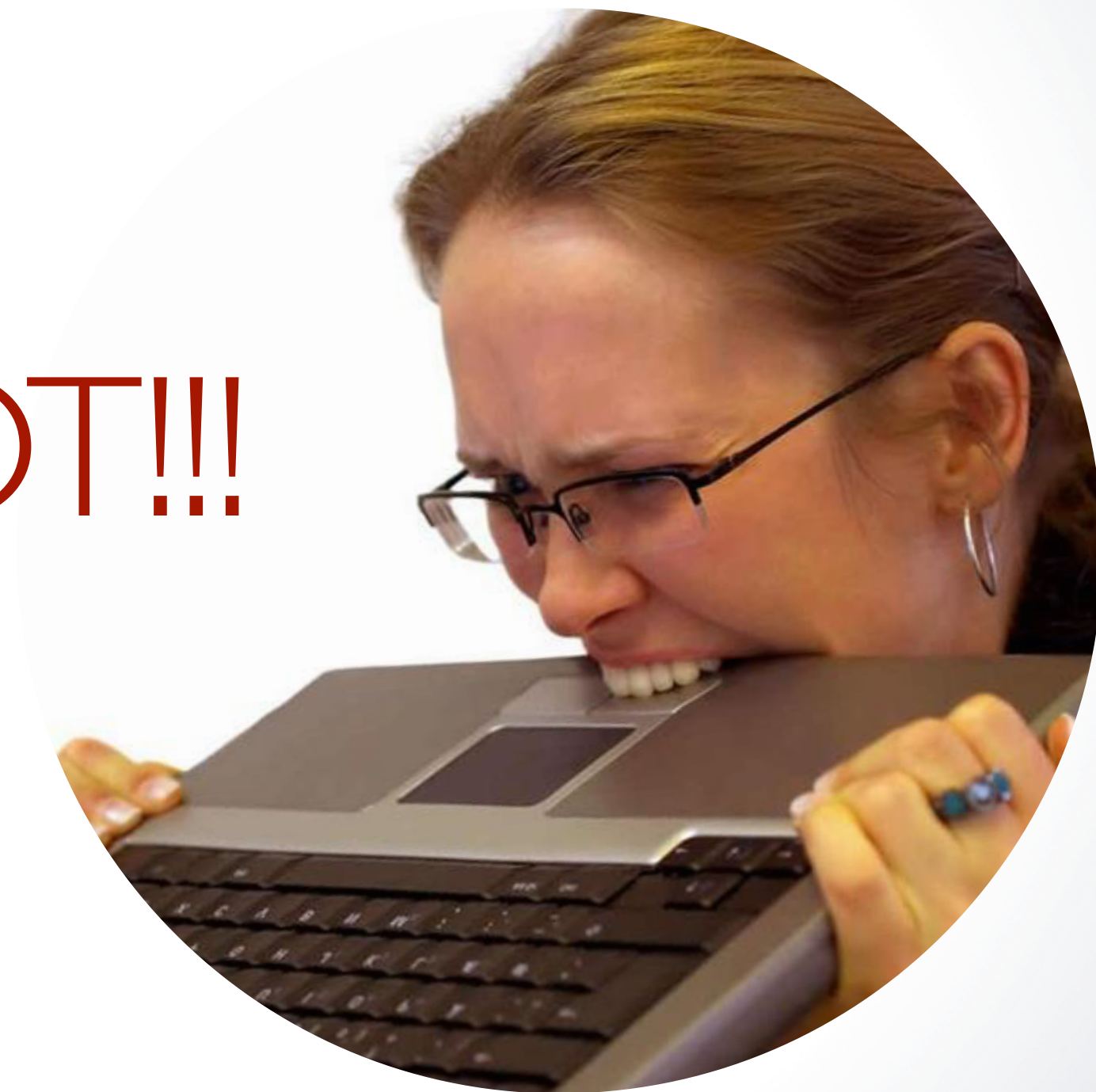


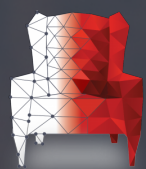
## Required subjects to master

- Linux Shell, C++ or Python
- ROS Basics
- ROSTF
- ROS URDF
- ROS Debugging
- ROS Navigation, Perception and Manipulation
- Program your robot



THAT'S A LOT!!!





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# LEARN ROS **HOW TO LEARN FAST?**



## HOW TO LEARN ROS FAST ?

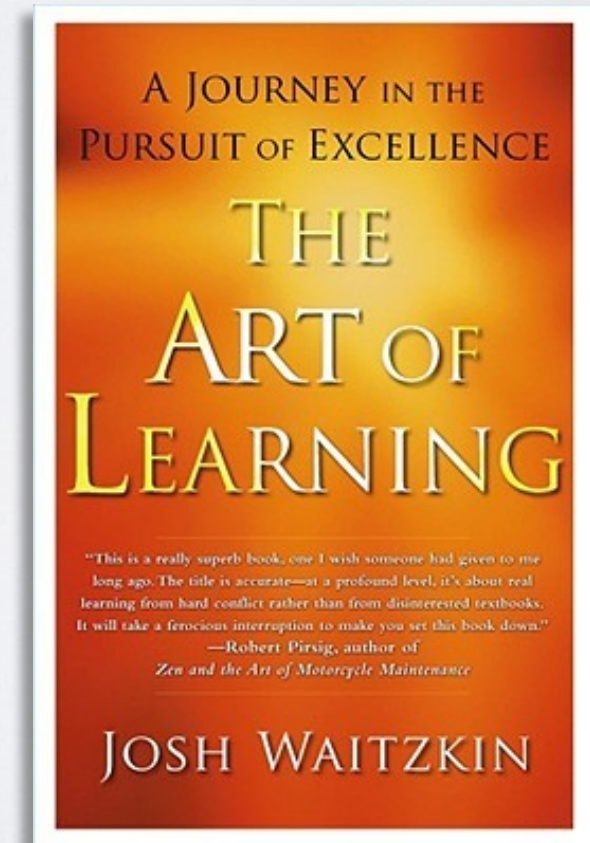
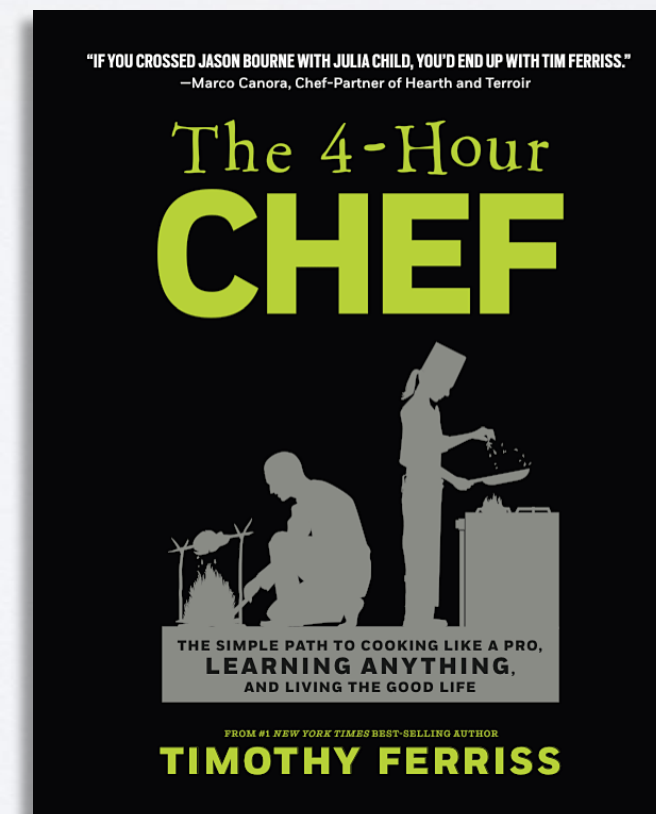
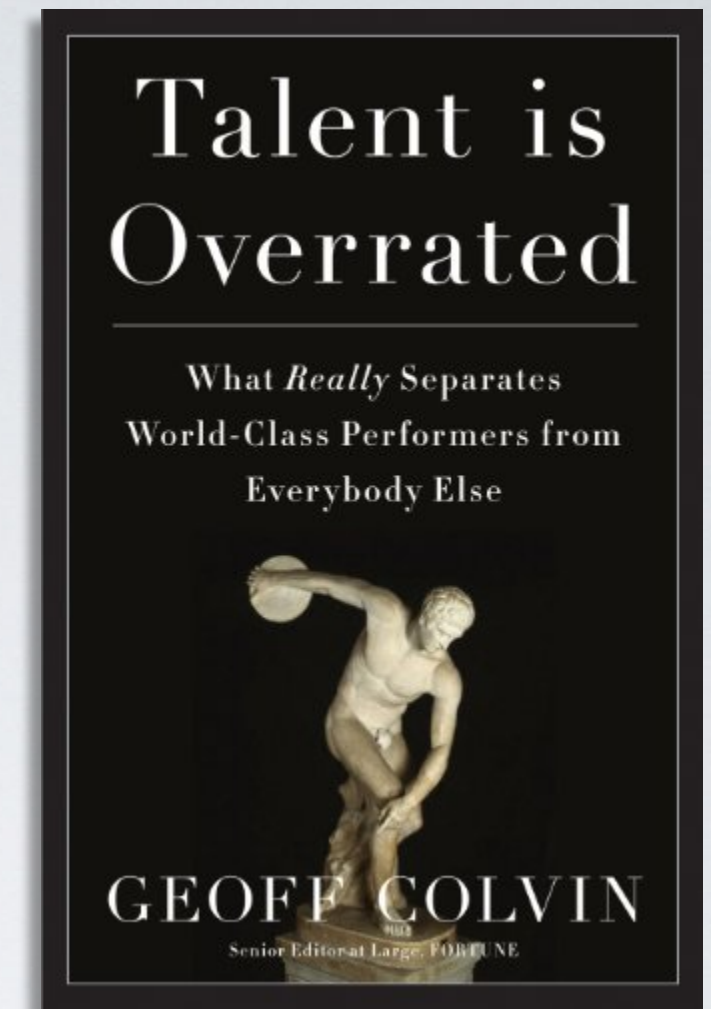
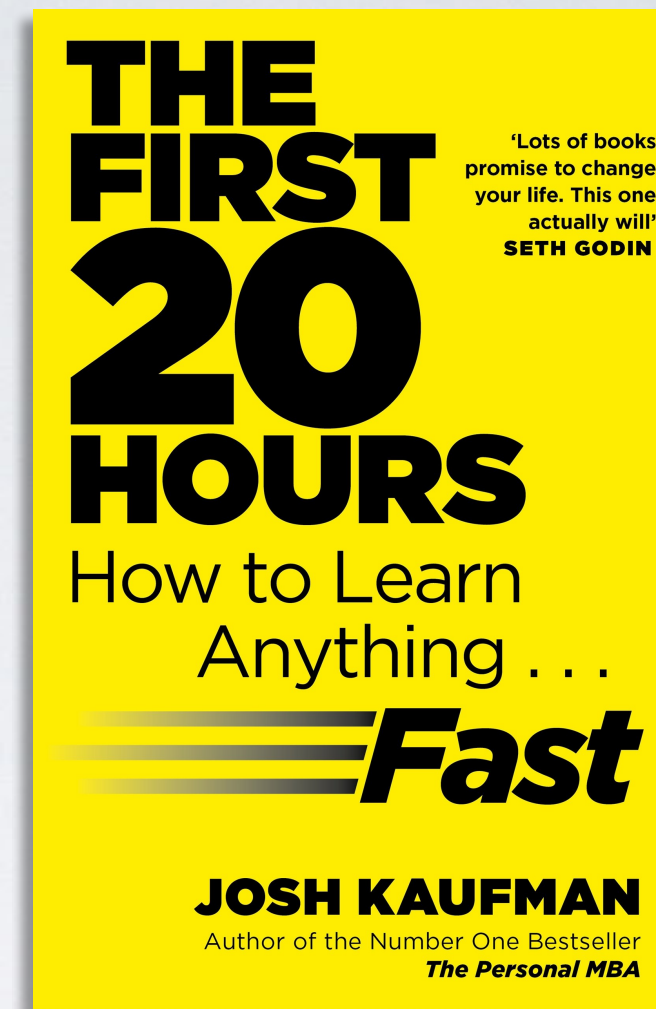
Specifically designed curriculum:

- ✓ Deconstruct ROS
- ✓ Identify 20/80
- ✓ Remove the rest
- ✓ Practice
- ✓ Take exams/exercises

**No Copy/Paste Allowed!!!**



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# DECONSTRUCTION OF ROS

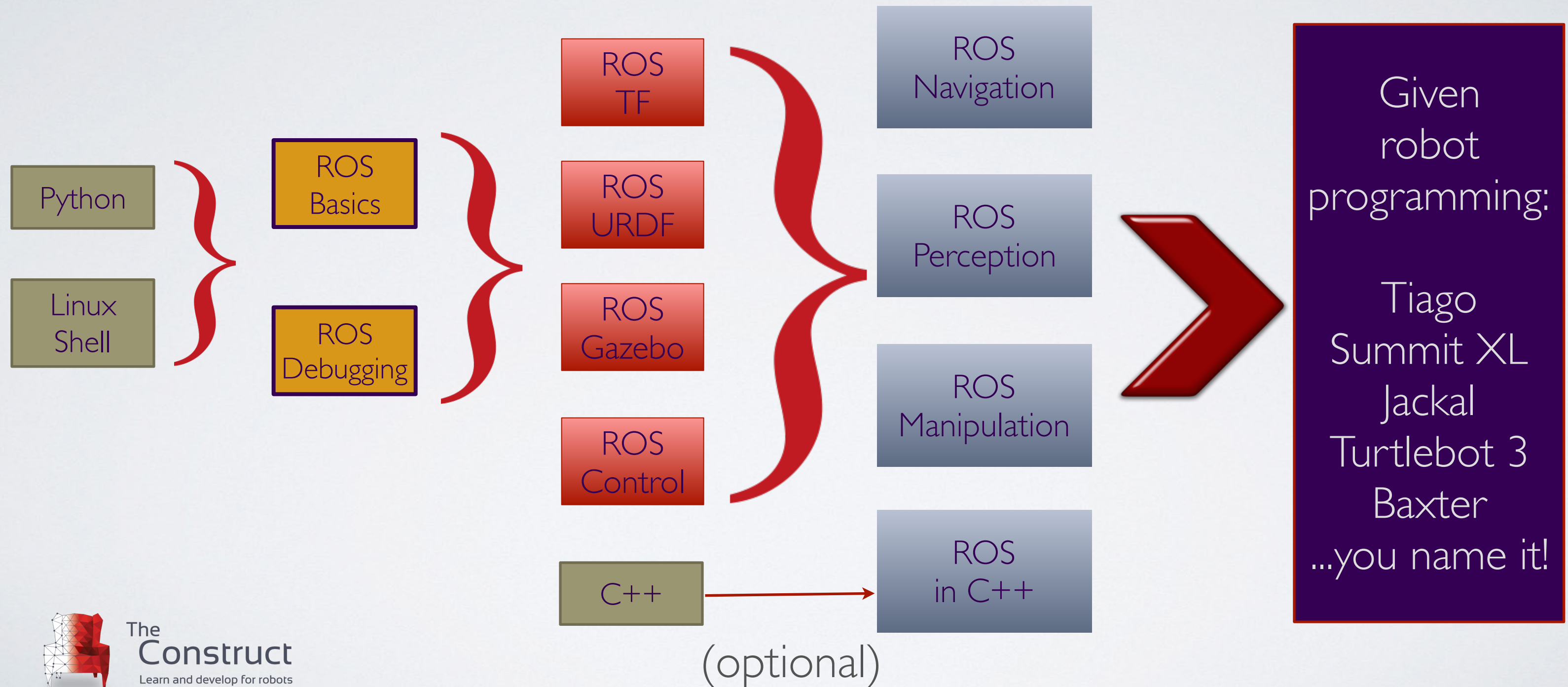
Pre-Conditions

Basic ROS

Full ROS Overview

Advanced ROS subjects

Specific ROS application



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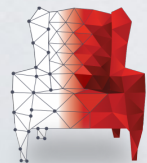
## YOU HAVE THREE OPTIONS



- You build this curriculum yourself
  - Simple way
  - Pro way



- You buy the curriculum





PRIOR TO ANY OF THOSE METHODS



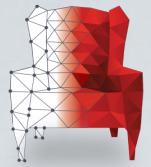
- Intern must learn Linux Shell
  - Use this online course:  
<https://www.codecademy.com/learn/learn-the-command-line>



- Intern must learn Python
  - Use this online course:  
<https://www.codecademy.com/learn/learn-python>



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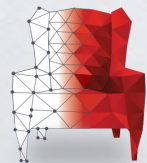
The Simple Way

**BUILD THE CURRICULUM**



BUILD THE CURRICULUM THE SIMPLE WAY

- Provide the intern a computer with ROS installed
- Make him use Python
- Make him do the tutorials in the following order:



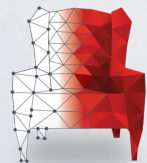
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## LIST OF TUTORIALS TO FOLLOW AND THE PROPER ORDER

1 / 3

- <http://wiki.ros.org/ROS/Tutorials/NavigatingTheFilesystem>
- <http://wiki.ros.org/ROS/Tutorials/CreatingPackage>
- <http://wiki.ros.org/ROS/Tutorials/UnderstandingTopics>
- <http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29>
- <http://wiki.ros.org/ROS/Tutorials/ExaminingPublisherSubscriber>



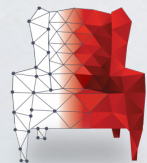


- <http://wiki.ros.org/ROS/Tutorials/WritingServiceClient%28python%29>
- <http://wiki.ros.org/ROS/Tutorials/ExaminingServiceClient>
- <http://wiki.ros.org/ROS/Tutorials/CreatingMsgAndSrv>
- <http://wiki.ros.org/ROS/Tutorials/UnderstandingServicesParams>
- <http://wiki.ros.org/ROS/Tutorials/DefiningCustomMessages>





- <http://wiki.ros.org/ROS/Tutorials/Recording%20and%20playing%20back%20data>
- <http://wiki.ros.org/tf/Tutorials>
- <http://wiki.ros.org/urdf/Tutorials>
- [http://wiki.ros.org/ros\\_control](http://wiki.ros.org/ros_control)
- <http://wiki.ros.org/navigation/Tutorials>



The Simple Way is for

- ✓ Labs with very low budget
- ✓ Labs with very limited time



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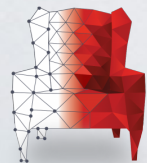
The Pro Way

# **BUILD THE CURRICULUM**



## BUILD THE CURRICULUM THE PRO WAY

- Make him use Python
- Prepare Gazebo simulations for practice
- Use Python Notebooks to write the curriculum and to integrate lessons with practice
- Provide a system for installation on user's computer
- Use the ROS wiki to prepare the curriculum



The Pro Way is for

- ✓ Labs with very low budget
- ✓ Labs with some prep time





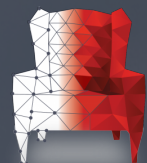
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**BUY THE CURRICULUM**

Yeah!

# ROBOT IGNITE ACADEMY

- you don't have to build
- you don't have to assist
- you don't have to follow
- you don't have to care about the computer



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[www.robotigniteacademy.com](http://www.robotigniteacademy.com)




**ROS IN 5 DAYS**  
Learn ROS in an effective way

**LEARN ROS IN 5 DAYS**  
**For Beginners**

Yellow Level: Entering ROS in 5 days

[www.robotigniteacademy.com](http://www.robotigniteacademy.com)



**ROBOT IGNITE ACADEMY**  
**TF ROS 101**

How to use TF in ROS 101

[www.robotigniteacademy.com](http://www.robotigniteacademy.com)



[www.robotigniteacademy.com](http://www.robotigniteacademy.com)

**Robot Creation with URDF ROS**

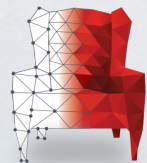
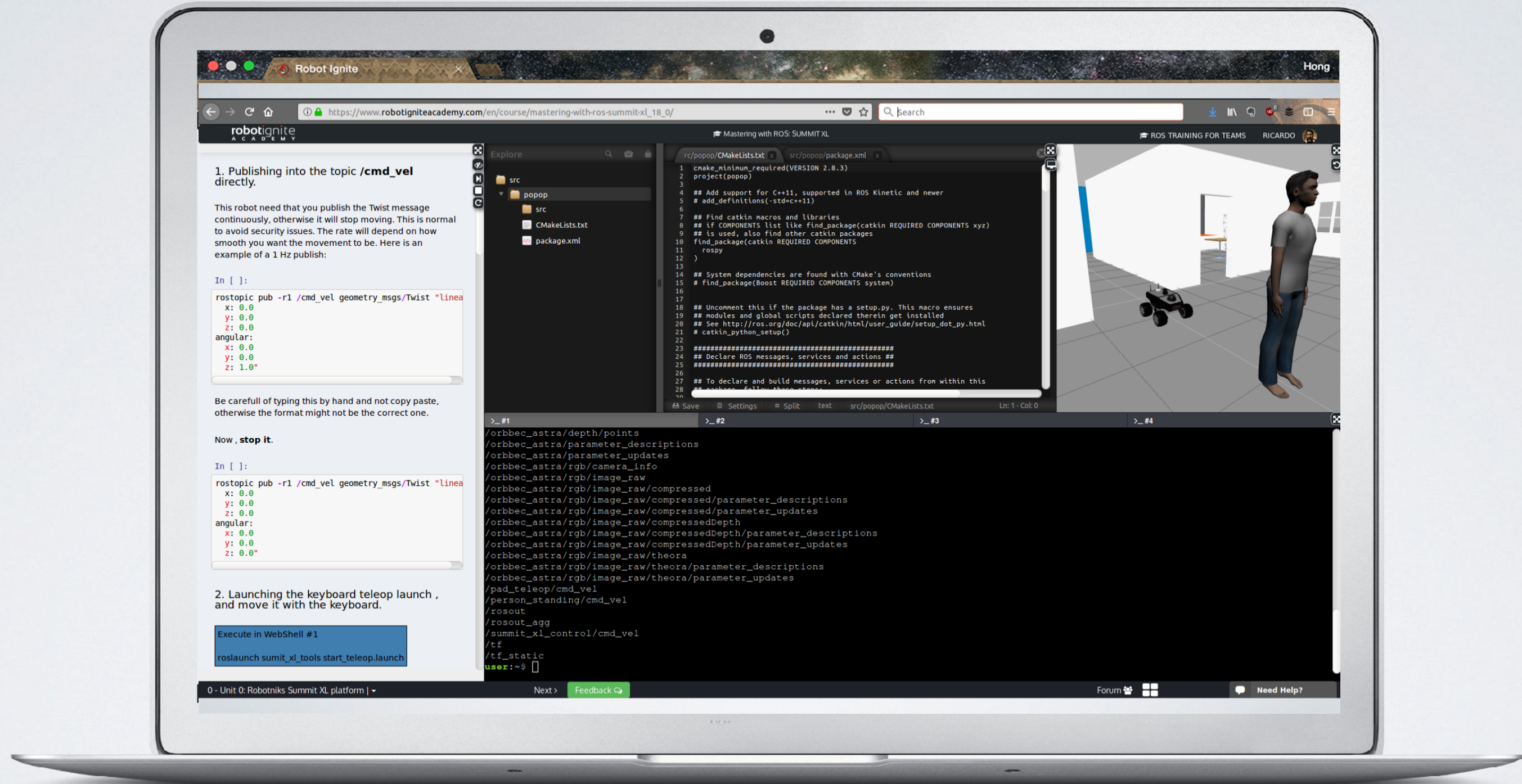
Learn how to create URDF files by creating three different robots



[www.robotigniteacademy.com](http://www.robotigniteacademy.com)

**ROS Control 101**

Learn how to connect your simulated robot with the ros\_control packages.



ROS Basics

ROS Navigation

ROS Perception

Robot Creation

ROS Auto-Vehicles

ROS-Industrial

RGB-Navigation

ROS Control

RTAB-Map in ROS

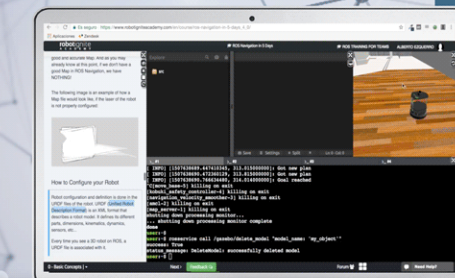
ROS RViz

ROS Manipulation

OpenAI Gym

URDF ROS

TF ROS



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## ROS Navigation

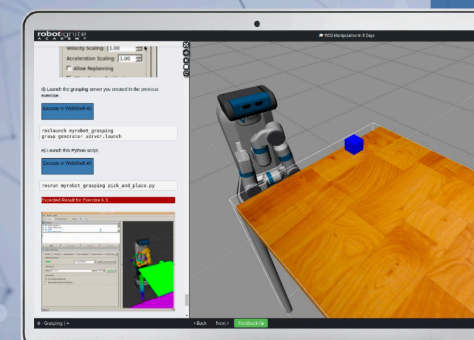
Give you the basic tools and knowledge to be able to understand and create any basic ROS Navigation related project.



www.robotigniteacademy.com

## ROS Perception in 5 days

Learn how to include perception in a ROS based



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## ROS Manipulation

Learn how to add object manipulation in a ROS based service robot



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www.robotigniteacademy.com

## Mastering with ROS: TIAGo

Learn how you can start working with a TIAGo robot from PAL Robotics.

**PAL** ROBOTICS



ROBOT IGNITE ACADEMY  
www.robotigniteacademy.com

## Mastering with ROS: Turtlebot3

Learn how you can start working with a Turtlebot3 robot using both versions, Burger and Noetic.

**ROBOT**



ROBOT IGNITE ACADEMY  
www.robotigniteacademy.com

## Mastering with ROS: SUMMIT XL

Learn how to program the mobile robot Summit XL for real world applications

**Robotnik**



Your Courses

Log out



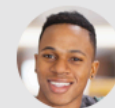
Student Activity

Add New Student

Search

Setting

Hi Pro. Steffen, this is your students



Daniel  
(Active Student)



Hannah  
(Active Student)



Angelos  
(Active Student)



Daniel  
daniel@upc.com

Today



Started

ROS-Industrial



Completed

ROS Manipulation



Completed

ROS Basics Exam

Overall Activities

From 20 to 27 Oct, 2017 ▼



Completed 2 courses



Passed 1 Exam

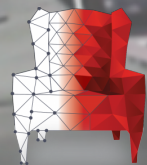


Completed 3 courses



Completed 5 courses





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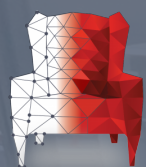
ROBOT IGNITE ACADEMY

## THE ACADEMY WAY IS FOR:

- Labs with low budget
- Labs with very limited time
- Labs that want to excel



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DEMO

# B O N U S

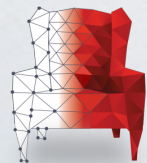
# HOW TO GET THE BONUS?

Send email to:

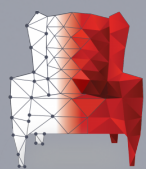
[info@theconstructsim.com](mailto:info@theconstructsim.com)

with *Subject*:

I want to train my interns fast!



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# ROS WEBINAR QUESTIONS ?

Ricardo Téllez | CEO of The Construct