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Learn and develop for robots

W E B I N A R

# HOW TO TRAIN YOUR TECH TEAM ON ROBOT OPERATING SYSTEM

Ricardo Téllez | CEO of The Construct

DECEMBER 13<sup>TH</sup>, 2017

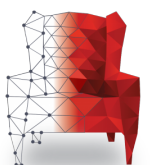
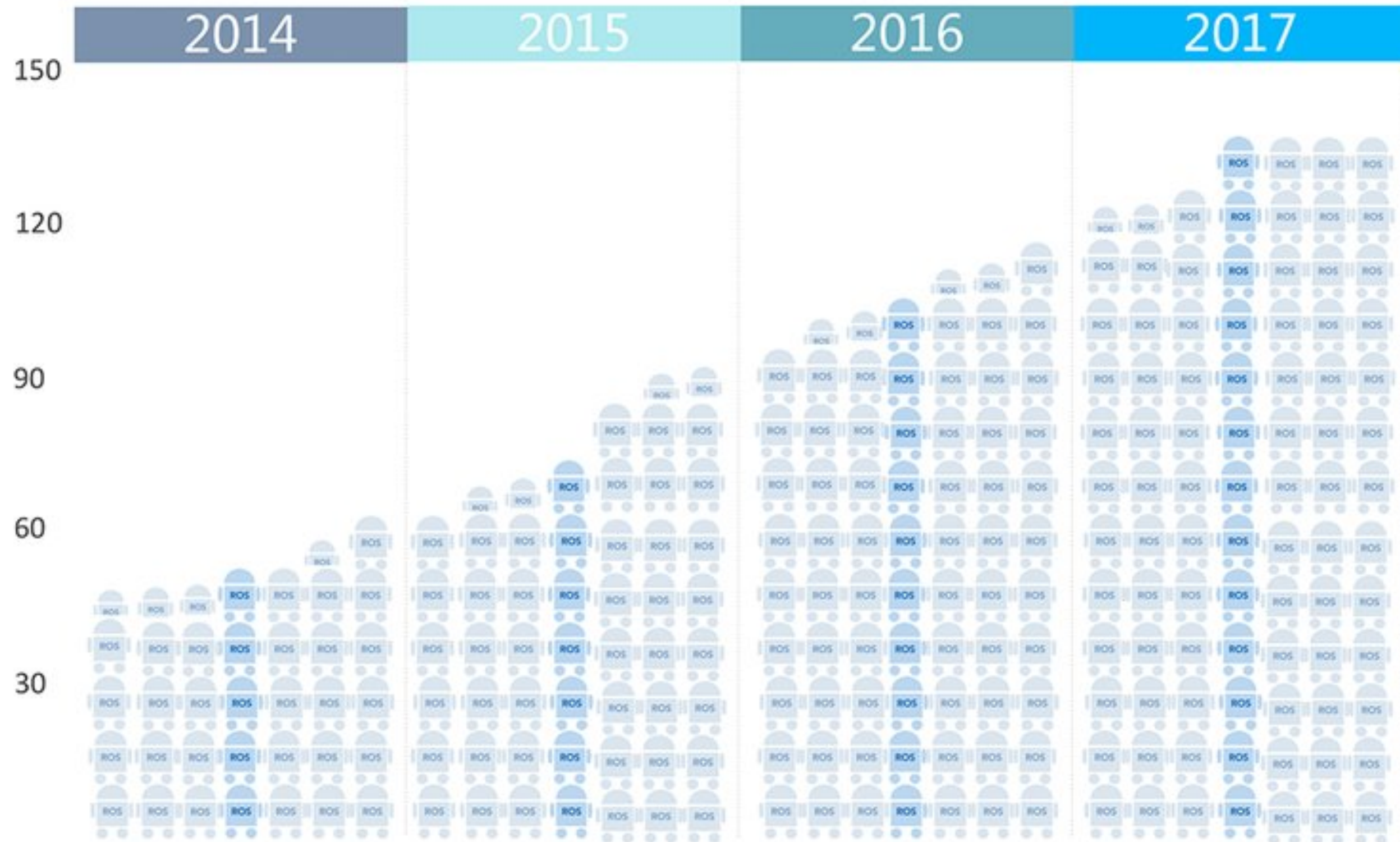
[WWW.THECONSTRUCTSIM.COM](http://WWW.THECONSTRUCTSIM.COM)





# Robots Listed On robots.ros.org

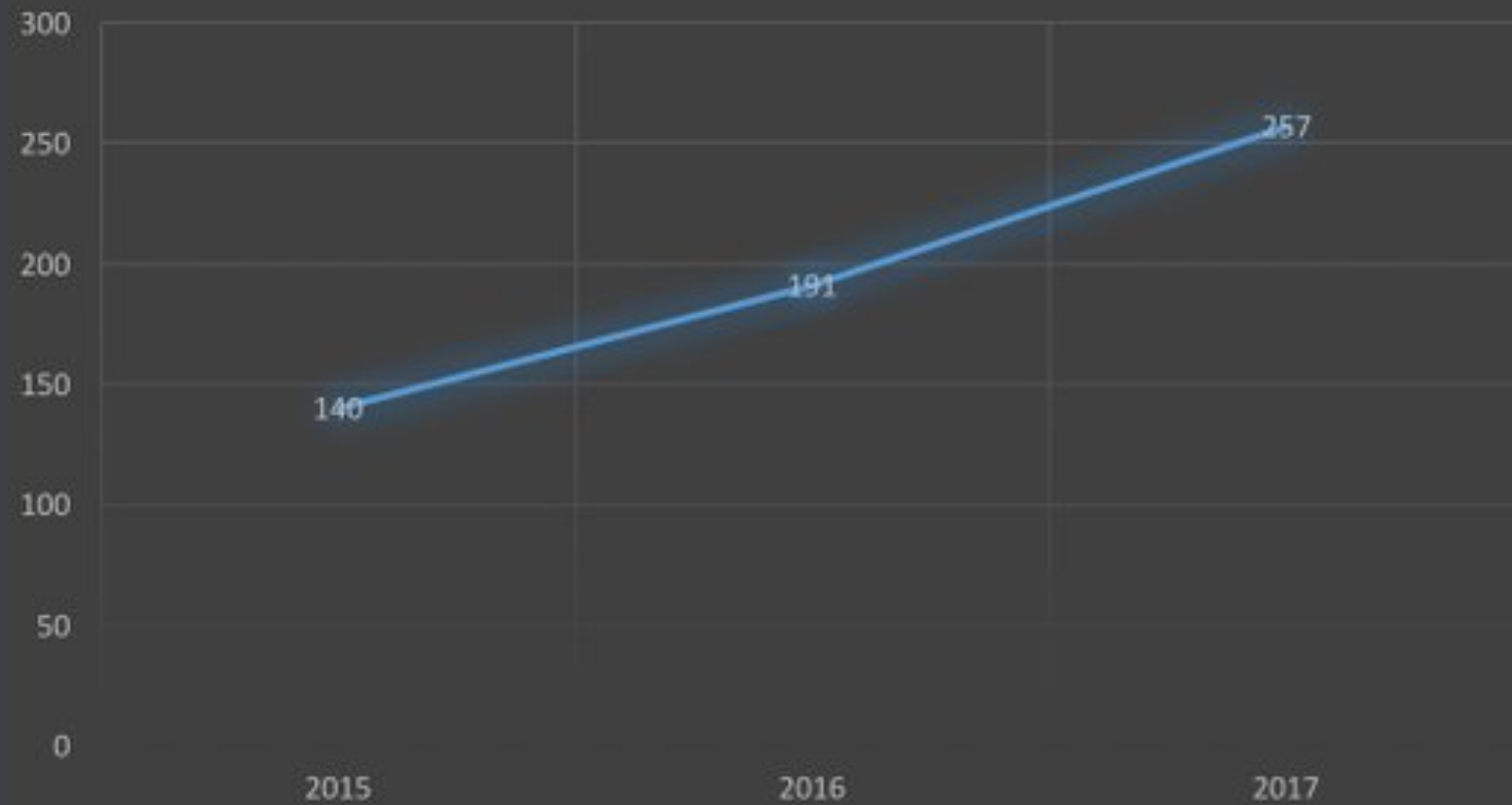
The N° of different types of robots available to the community with ROS drivers



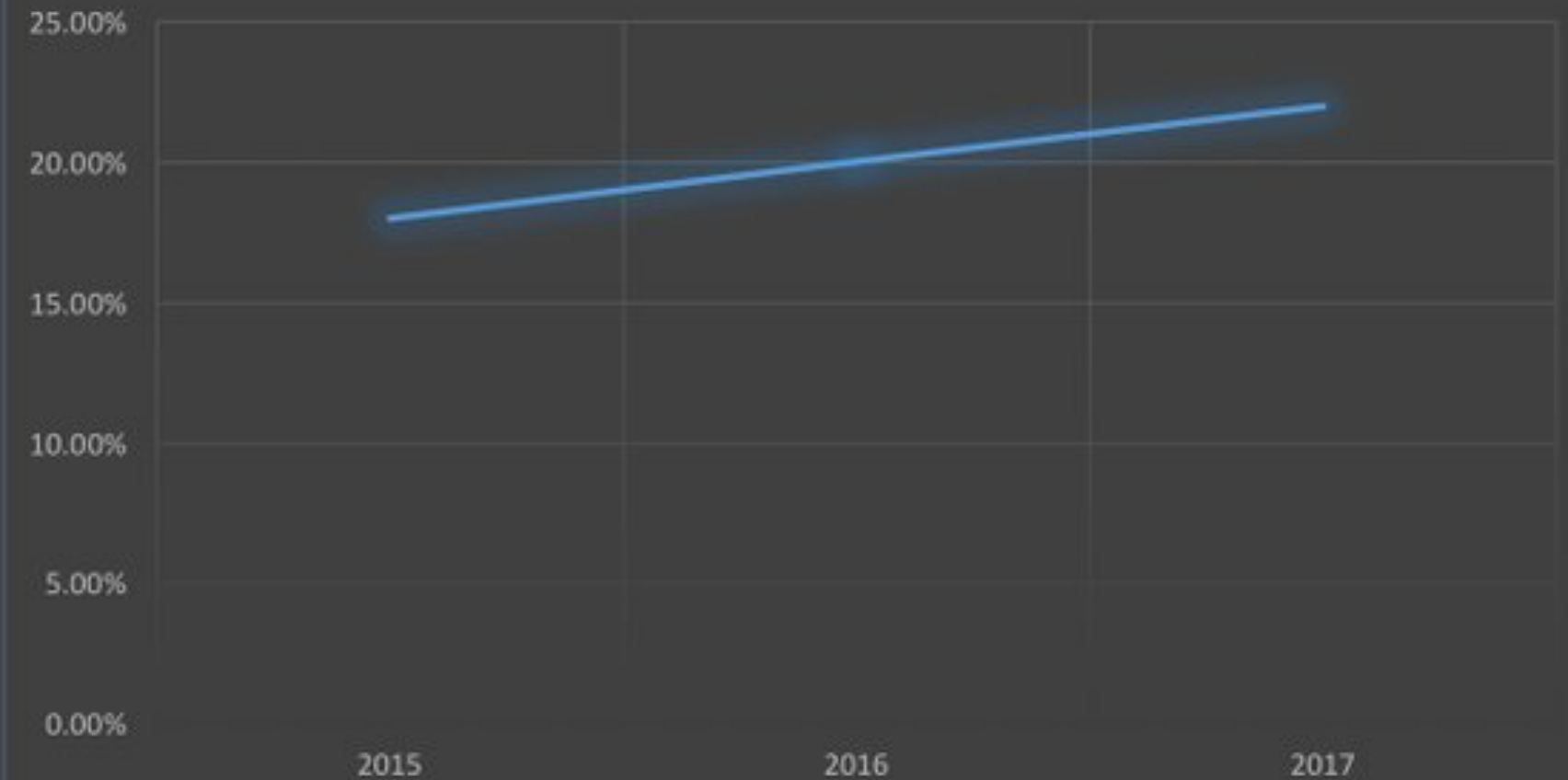


# ::ROS JOB PROSPECTS

**Evolution of Job Opportunities Require ROS**  
(from 2015 - 2017)



**The proportion of ROS JOB in all job offers**  
(from 2015 - 2017)

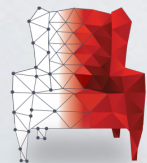


(data sources: robotics-worldwide)



# MY GOAL

- TO SHOW YOU HOW TO  
EQUIP YOUR TEAM WITH  
ROS KNOWLEDGE... FAST!



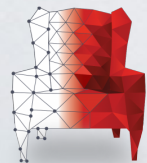


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- WHICH ARE MAIN SUBJECTS YOUR TEAM MUST LEARN
- HOW TO BUILD AN OPTIMAL PATH FOR FAST LEARNING
- HOW TO MAKE YOUR TEAM LEARN ROS IN 5 DAYS





OUR  
CLIENTS  
SAY

- **Miguel A. Olivares**, Scientist at *Luxembourg University*

*"We used the RIA method with students didn't have any previous knowledge about ROS or robotics. In just 3 days, they were able to go through the ROS Basic course with amazing results"*





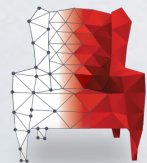
# B O N U S

# STAY WITH ME TO THE END

Instructions for how to get extra bonus at the end of the webinar

Bonus includes:

- These slides
- 20 pages pdf with extra details about how to do it

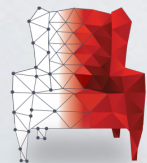


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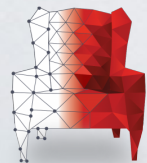
# TEAM READY

- IN A RECORD TIME
- WITH LITTLE PREPARATION FROM YOU
- WITHOUT HAVING TO MANAGE THEM



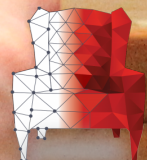
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?

- TRIED TO UNDERSTAND ROS BUT... NO WAY!
- TRIED TO FOLLOW TUTORIALS... FRUSTRATION!
- TRIED TO INSTALL ROS + GAZEBO... PROBLEMS!





# I UNDERSTAND YOU!



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# IT ALSO HAPPENED TO ME

That is me struggling with ROS



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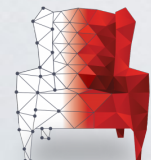




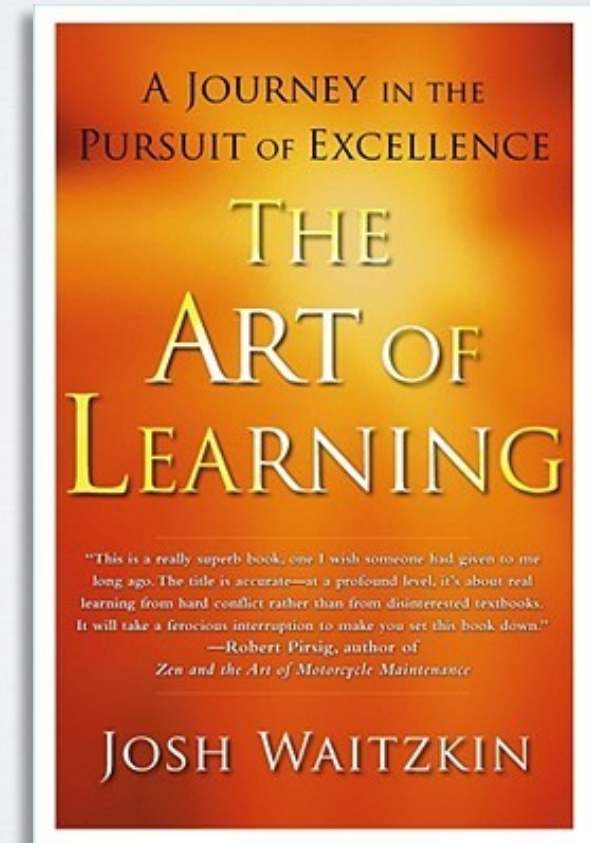
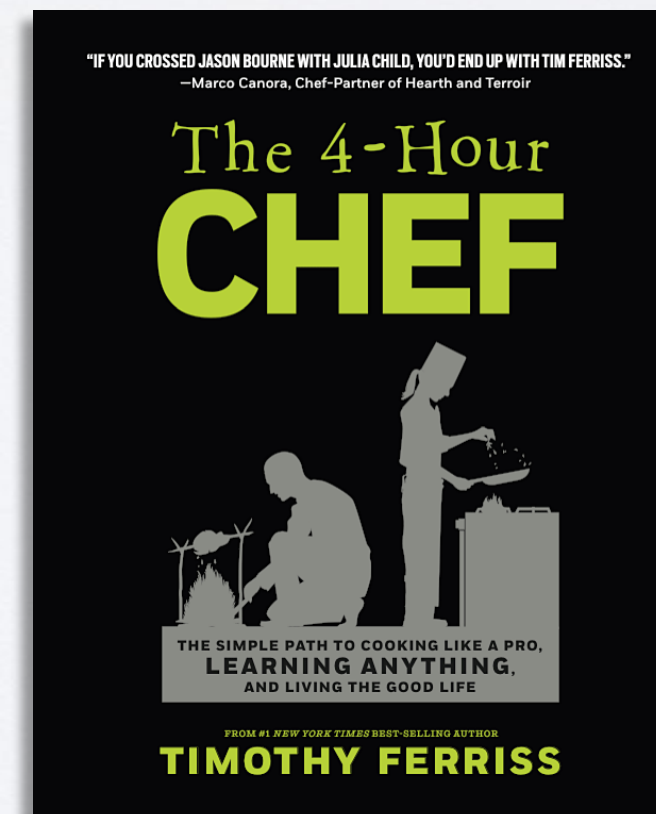
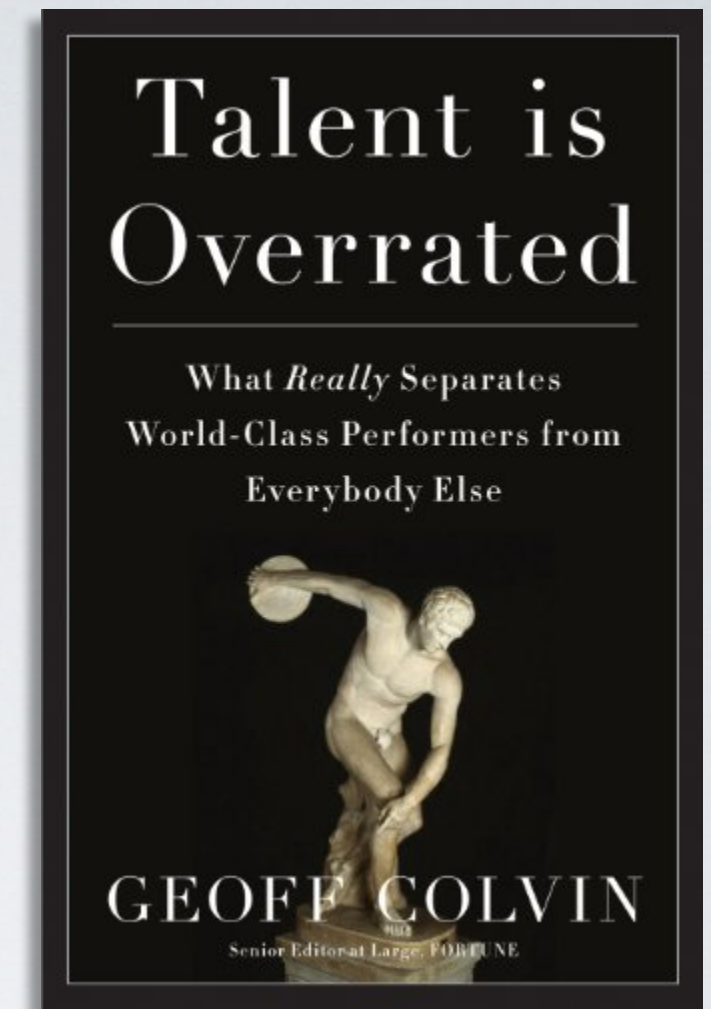
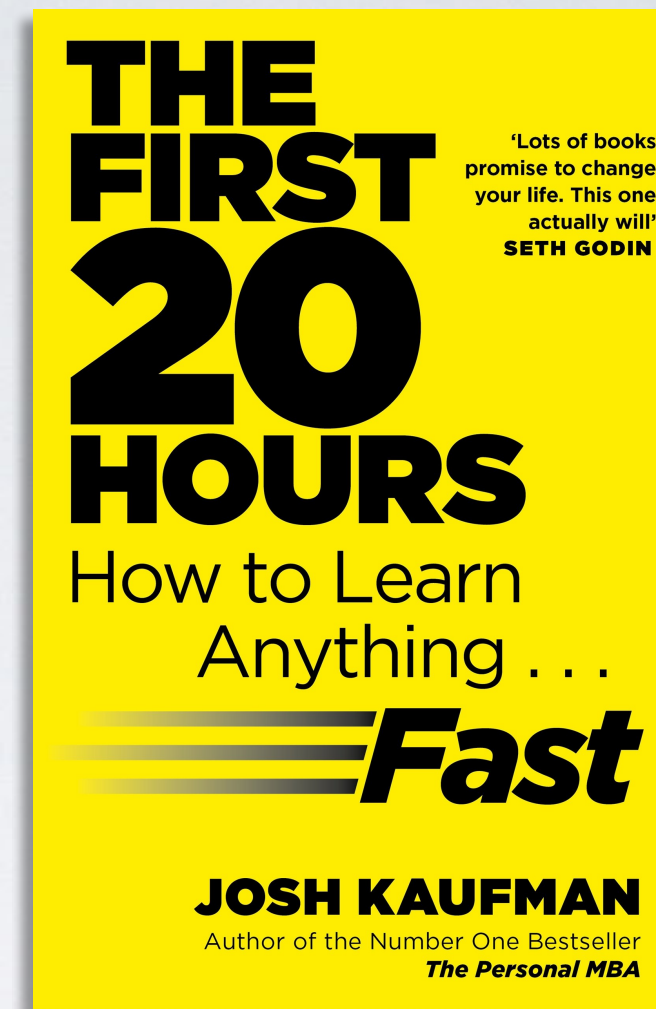
HOW TO TEACH ROS FAST ?

APPLY A METHOD FOR LEARNING:

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



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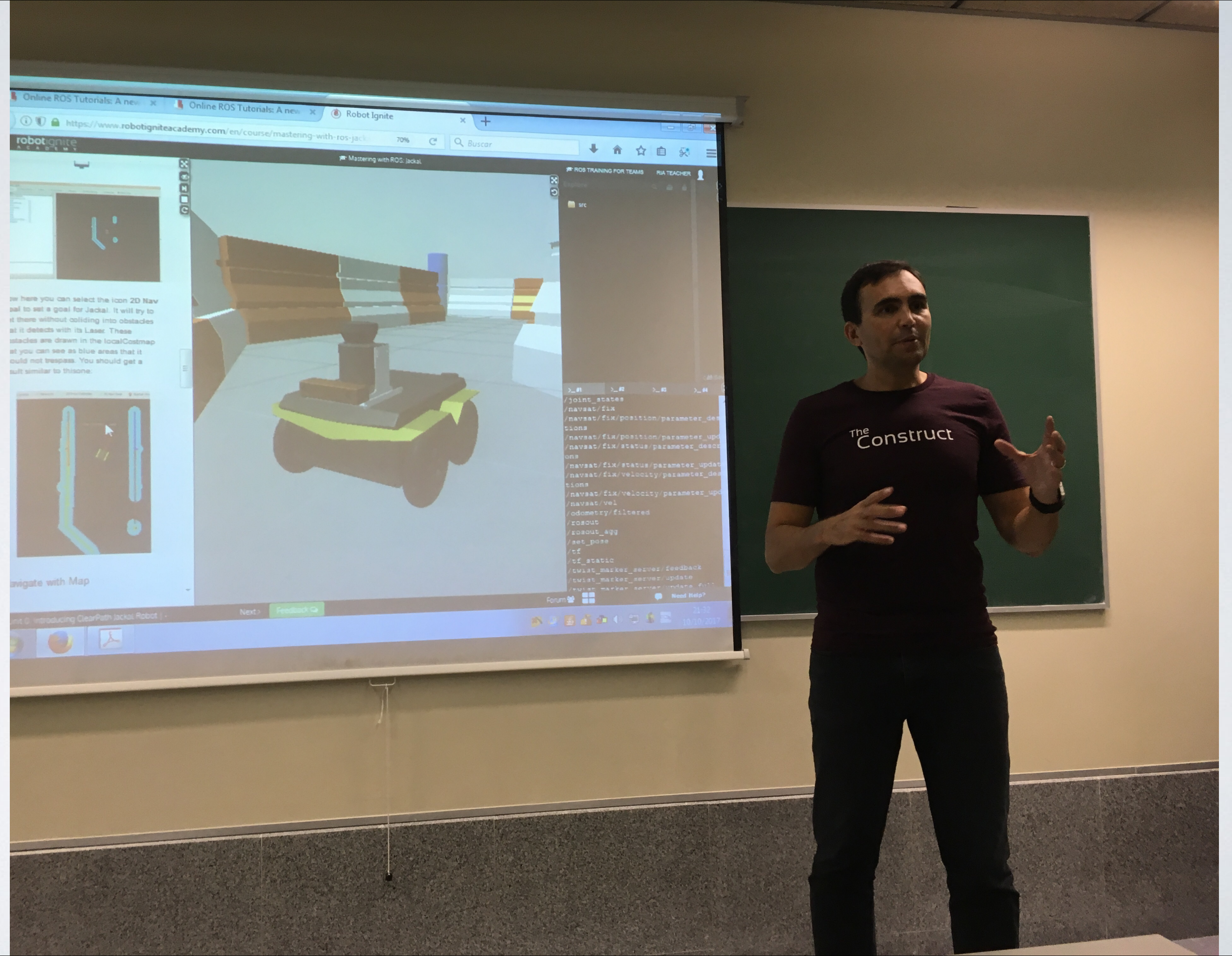


# S P E A K E R

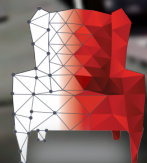
**Ricardo Téllez, PhD**  
CEO of The Construct

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

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







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- HAVE YOU TRIED TO FOLLOW THE ROS WIKI TUTORIALS AND FELT FRUSTRATED OF THE SLOW IMPROVEMENT AND UNDERSTANDING?

The screenshot shows the ROS.org website with several key features highlighted by red boxes and callouts:

- ROS.org logo:** The top left of the page features the ROS.org logo, which consists of a 3x3 grid of dots followed by the text "ROS.org".
- Navigation links:** Below the logo are links for "About", "Mailing Lists", and "code.ros.org".
- Search box:** A search box is located on the right side of the page, with a "Text" button and a "Titles" button. A callout explains: "The search box allows you to search over both the **text** and **titles** of wiki pages. The default search is text."
- Documentation link:** A large blue button labeled "Documentation" is on the left. A callout explains: "The Documentation and the ROS.org links will take you to the ROS landing page with the list of relevant links."
- Browse Software link:** A large blue button labeled "Browse Software" is in the center. A callout explains: "The Browse Software link will display a list of all the software packages in ROS, along with a brief description."
- News link:** A large blue button labeled "News" is on the right. A callout explains: "The News link will keep you informed about the latest happening with ROS."
- Contribute link:** A callout points to the "code.ros.org" link, stating: "This is where you can sign up to contribute to ROS."





# Q U O T E

# YOU ARE AT THE PROPER PLACE!

- **Angel Soriano**, teacher at *University of Valencia*, Spain

*"Thanks to The Construct and its team, I challenged myself to teach ROS from zero, and the results were exceptional"*



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POLITÈCNICA  
DE VALÈNCIA



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<https://www.linkedin.com/in/ángel-soriano-vigueras-67445170>



# DECONSTRUCTION OF ROS

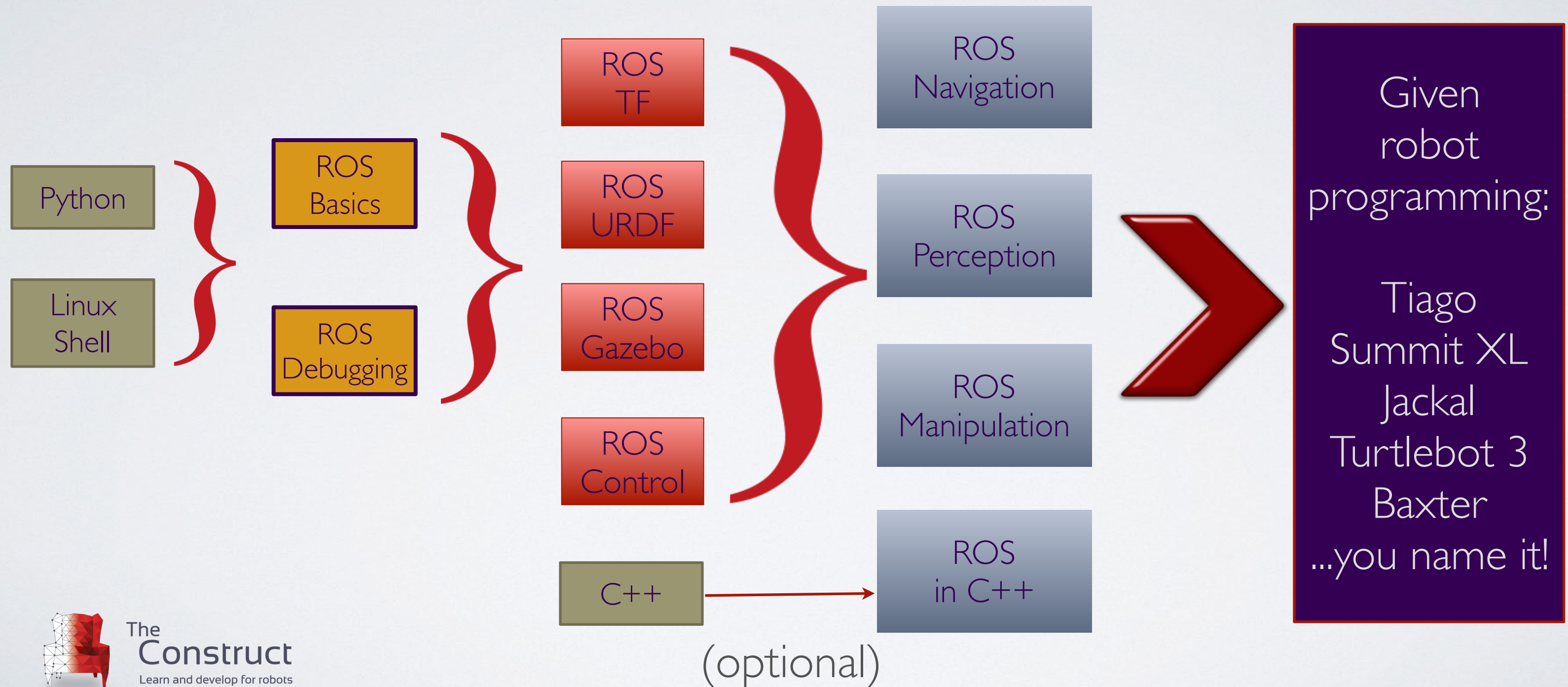
Pre-Conditions

Basic ROS

Full ROS Overview

Advanced ROS subjects

Specific ROS application



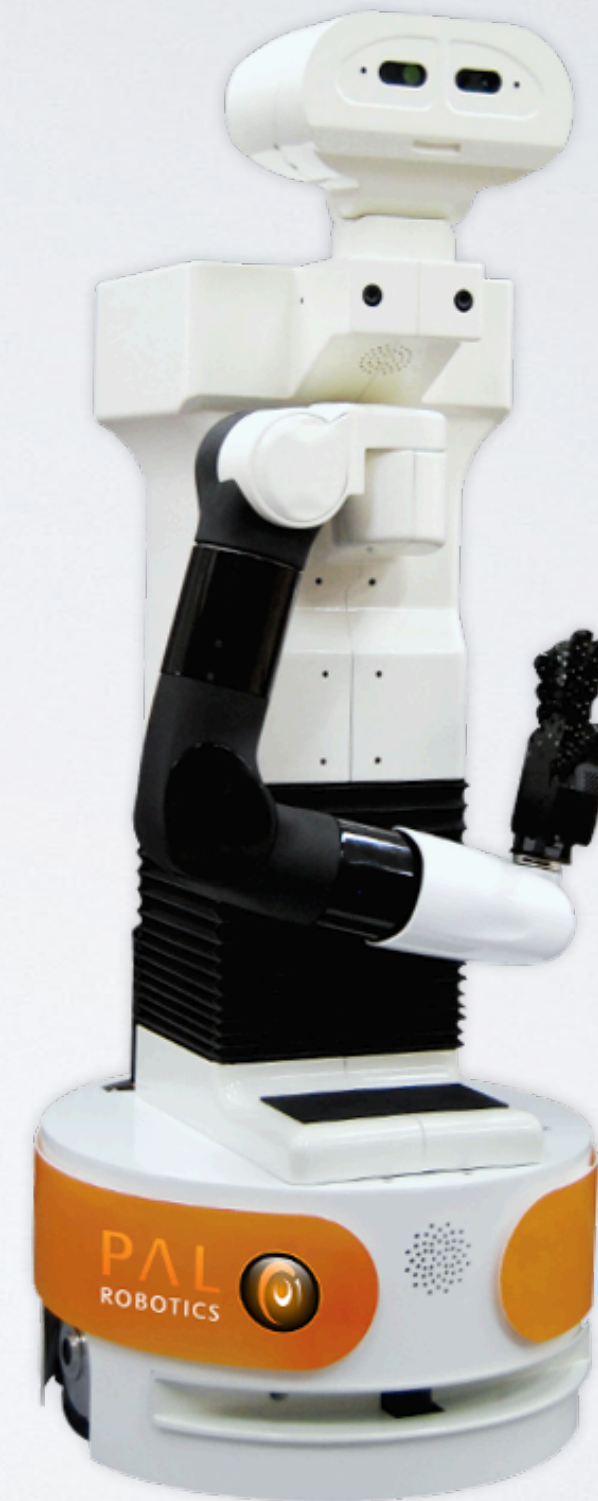
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## REQUIRED ROS SUBJECTS TO MASTER

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







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# How To **BUILD THE CURRICULUM**





## BUILD THE CURRICULUM

- Make team use Python
- Install ROS via Docker container
- Prepare Gazebo simulations for practice
- Use a specific ROS wiki path for optimal learning







## MAKE TEAM USE PYTHON



- Team must learn Linux Shell

- Use this online course:

- <https://www.codecademy.com/learn/learn-the-command-line>



- Team must learn Python

- Use this online course:

- <https://www.codecademy.com/learn/learn-python>

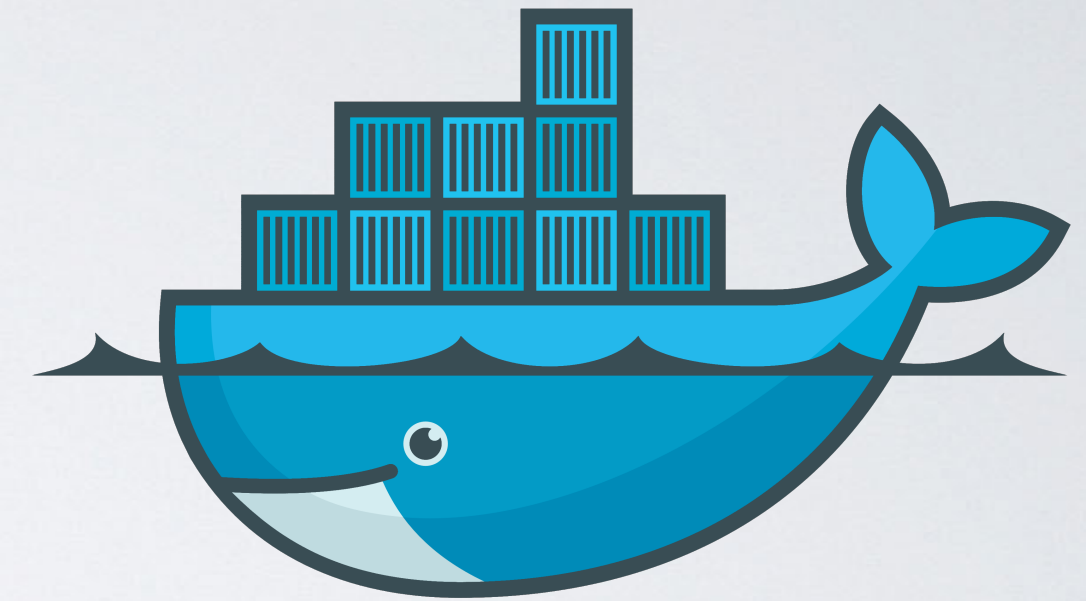




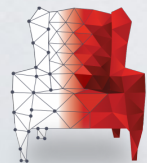
## INSTALL ROS VIA DOCKER

○ Follow instructions of this link:

<http://wiki.ros.org/docker/Tutorials/Docker>



# docker



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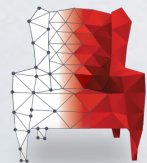
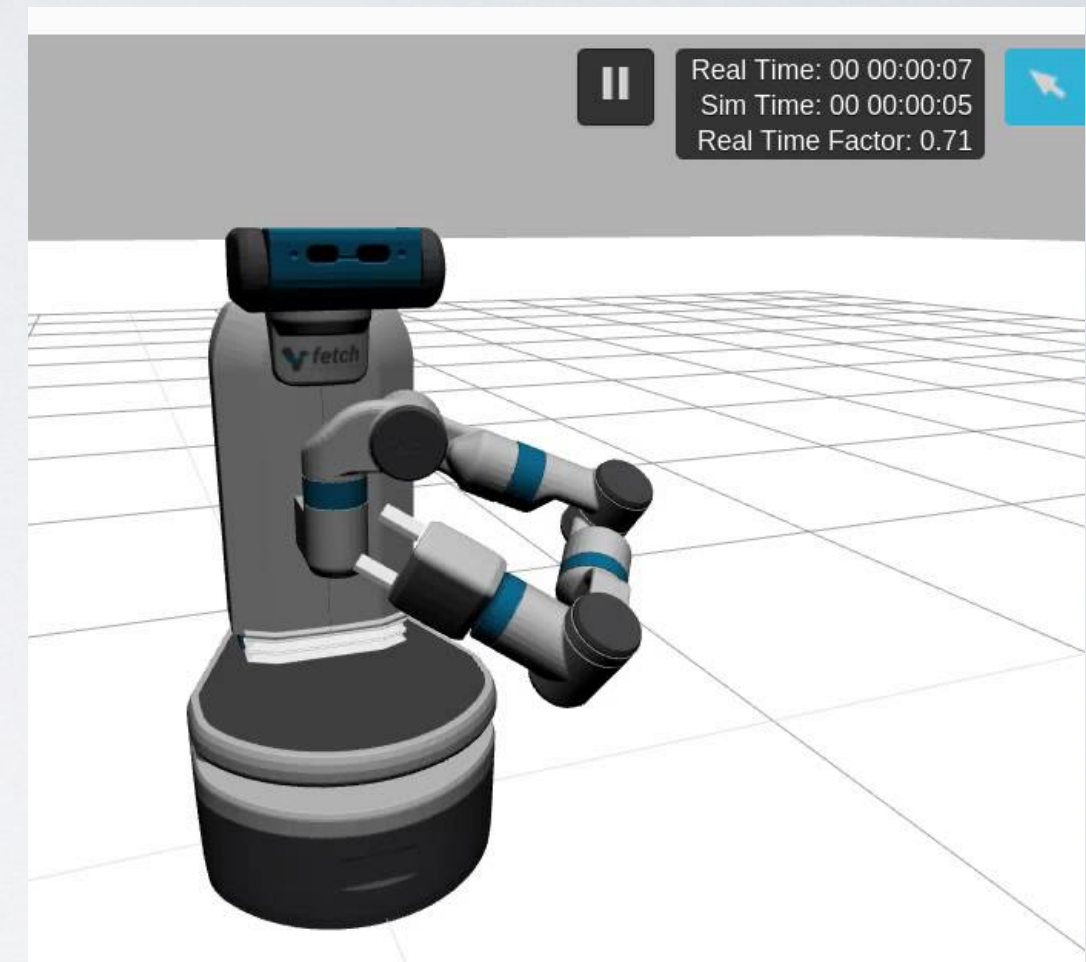




## GET THE ROBOT SIMULATIONS

- Get robot simulations to practice.
- Our company provides many robot simulations for free in this *git* repo

<https://bitbucket.org/account/user/theconstructcore/projects/PS>



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- <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>







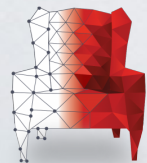
- <http://wiki.ros.org/ROS/Tutorials/WritingServiceClient%28python%29>
- <http://wiki.ros.org/ROS/Tutorials/ExaminingServiceClient>
- <http://wiki.ros.org/ROS/Tutorials/CreatingMsgAndSrv>
- <http://wiki.ros.org/ROS/Tutorials/UnderstandingServicesParams>
- <http://wiki.ros.org/ROS/Tutorials/DefiningCustomMessages>







- <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>







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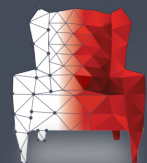
**GET EVERYTHING ALREADY DONE**

Yeah!



# ROBOT IGNITE ACADEMY

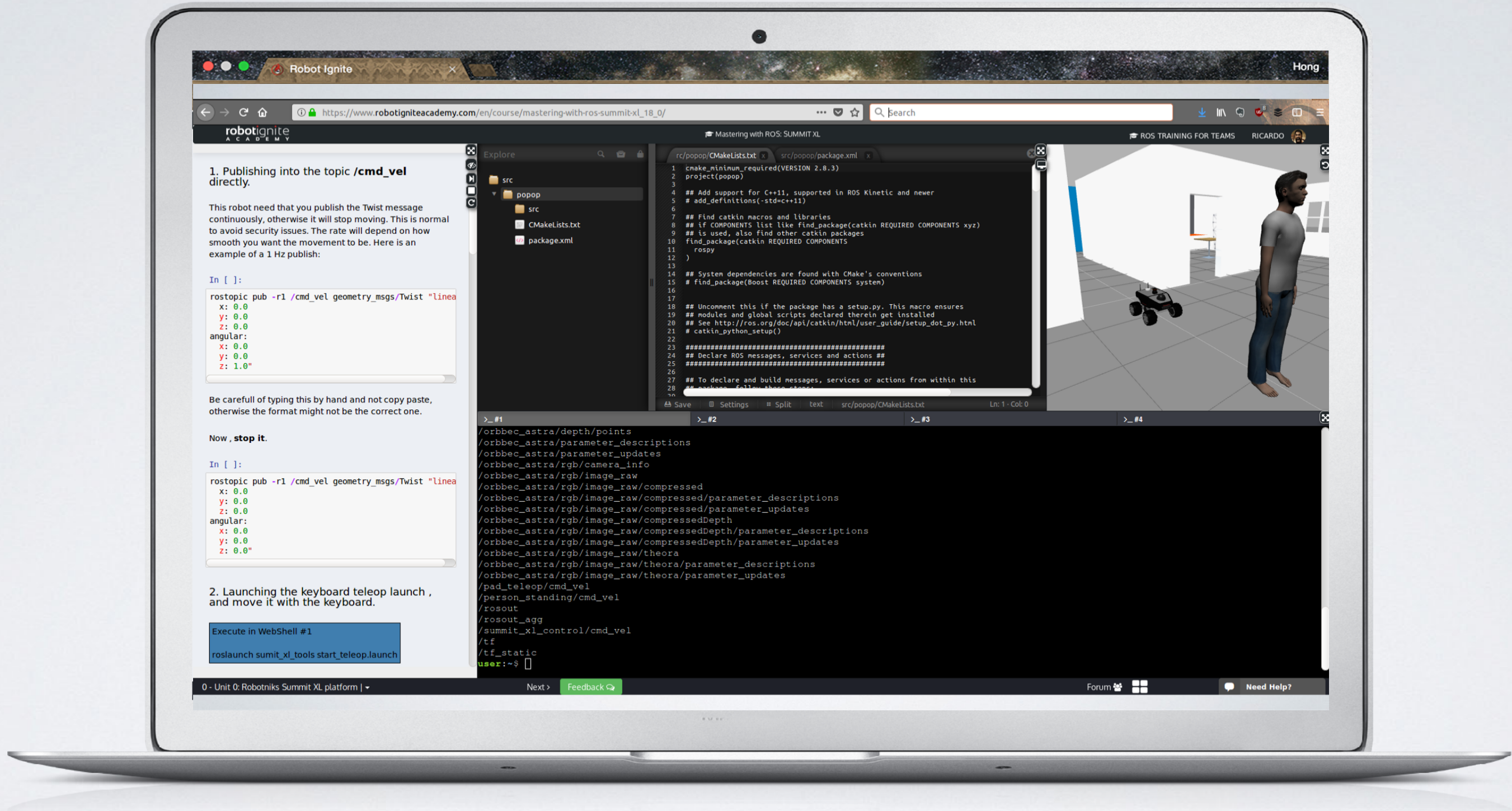
- you don't have to prepare anything
- you don't have to manage
- you don't have to care about the computers



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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

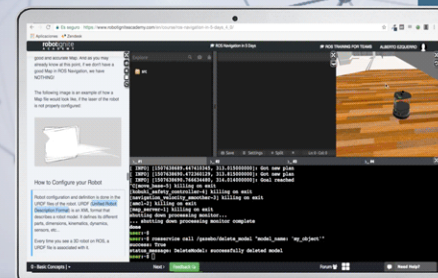
ROS RViz

ROS Manipulation

OpenAI Gym

URDF ROS

TF ROS



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## ROS Navigation

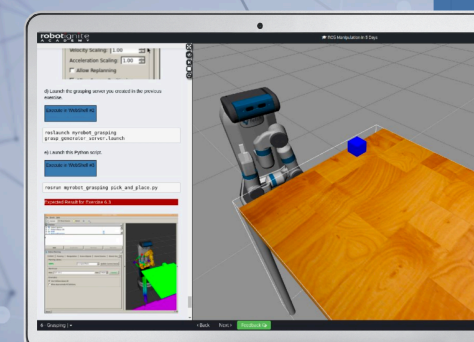
Give you the basic tools and knowledge to be able to understand and create any basic ROS Navigation related project.



www.robotigniteacademy.com

## ROS Perception in 5 days

Learn how to include perception in a ROS based



ROBOT IGNITE ACADEMY

## 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 Melodic.

**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



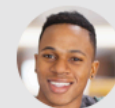
Student Activity

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





## World Clients | They are using our platform to empower their team with ROS skills

 **Robotnik**

**3M**



**S M A R T e**



**laSalle**

UNIVERSITAT RAMON LLULL

**BARO**  
VEHICLES



**ROSEN**

empowered by technology



**FESTO**



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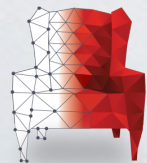




OUR  
CLIENTS  
SAY

- **Eiman Risnes Barakat**, R&D Engineer at *Eltorque AS*

*"It was the simplicity of getting started. And also the fact that I can learn on whatever computer (PC or Macbook) from any location!"*



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<https://www.linkedin.com/in/eiman-risnes-barakat-6b61833a>



## Weekly Plan €15/we

- ✓ Suitable for learners who have plenty of time to learn.
- ✓ Ideal for learn a specific ROS topic
- ✓ Weekly subscription fee for accessing all courses available
- ✓ 100+ high quality video tutorials

Start for free

## Monthly Plan €40/mo

- ✓ Suitable for learners who want to study more than one course in a short time.
- ✓ Monthly subscription fee for accessing all courses available
- ✓ Enjoy exclusive bonus content
- ✓ Interview with our ROS experts
- ✓ 100+ high quality video tutorials

Start for free

## Annual Plan €250/ye

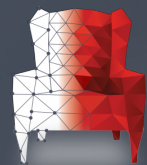
- ✓ Suitable for learners who do not have time to focus and learn everyday
- ✓ Perfect for people who want to master latest robotics knowledge (we update course monthly)
- ✓ Annual subscription fee for accessing all courses available
- ✓ Have priority to learn new courses

Start for free



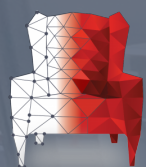
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DEMO



# B O N U S

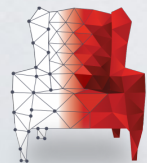
# HOW TO GET THE BONUS?

Send email to:

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

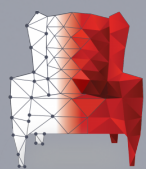
with *Subject*:

I want to train my tech team fast!



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# ROS WEBINAR QUESTIONS ?

Ricardo Téllez | CEO of The Construct