How to become a Robotics Developer

# The Future of Robot Development

RICARDO TÉLLEZ, PHD
WWW.THECONSTRUCT.AI

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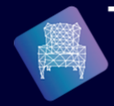
# What do I mean by Robotics Developer?



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# I do not mean

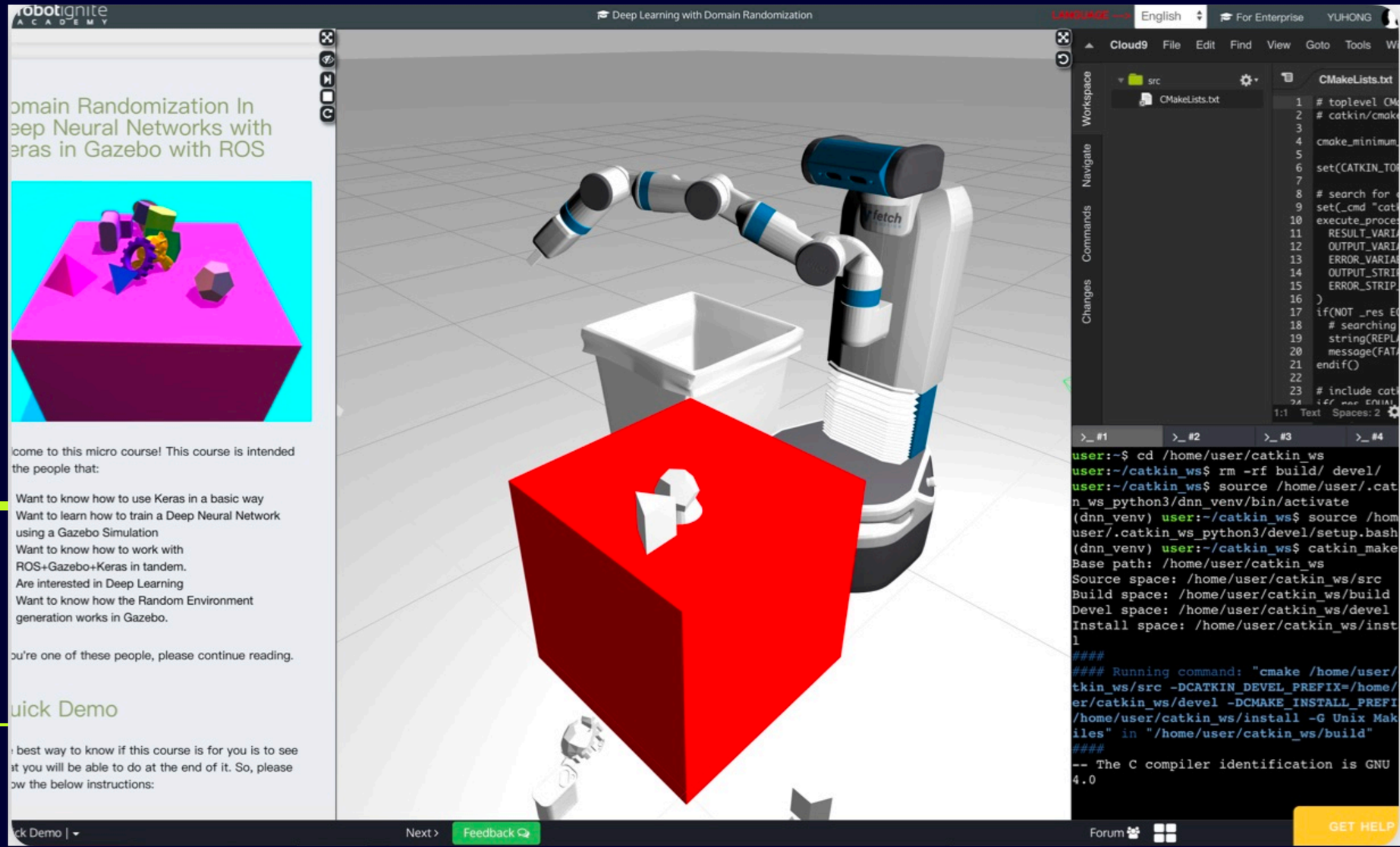
# I do mean

# ROS and Robot Navigation Teacher at La Salle Univ. Barcelona

**Ricardo Tellez, PhD**

CEO OF THE CONSTRUCT

# CEO of The Construct creators of Robot Ignite Academy




**Ricardo Tellez, PhD**

CEO OF THE CONSTRUCT

# The future of intelligent robotics lies in the software, not in the hardware

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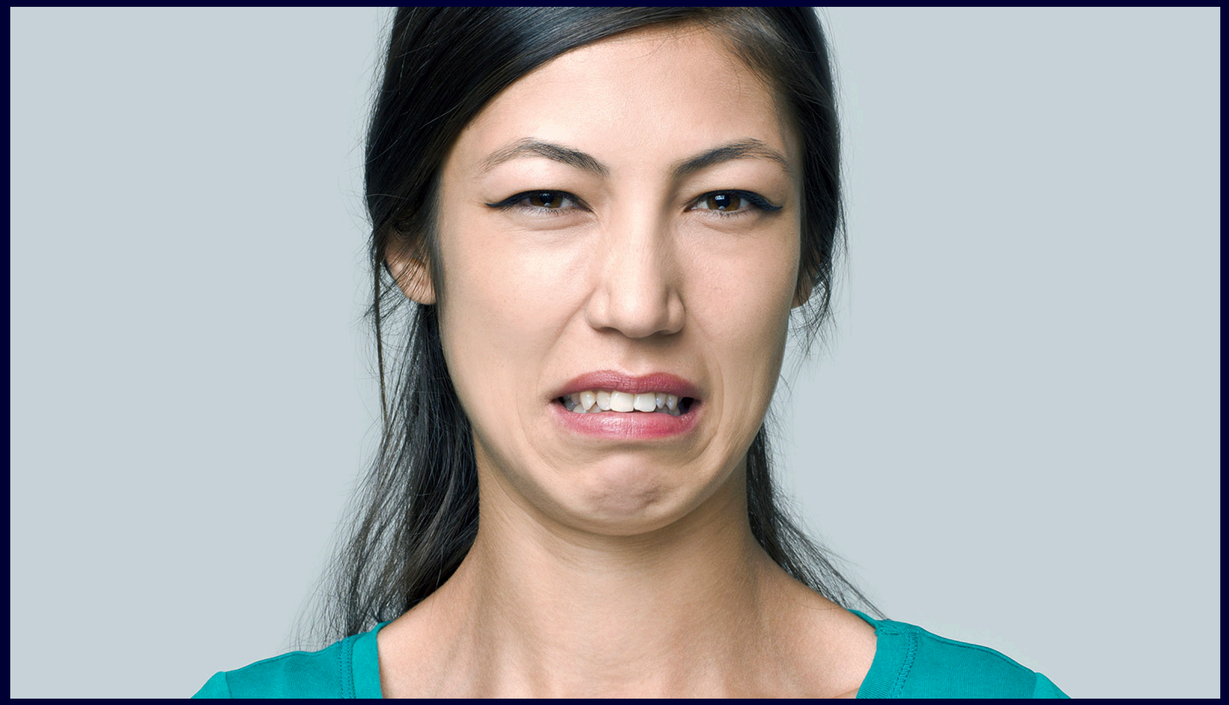
# So far, the robotics software has been done by the roboticists not by the computer scientists

Computer Scientists want to keep out of the hardware as much as possible



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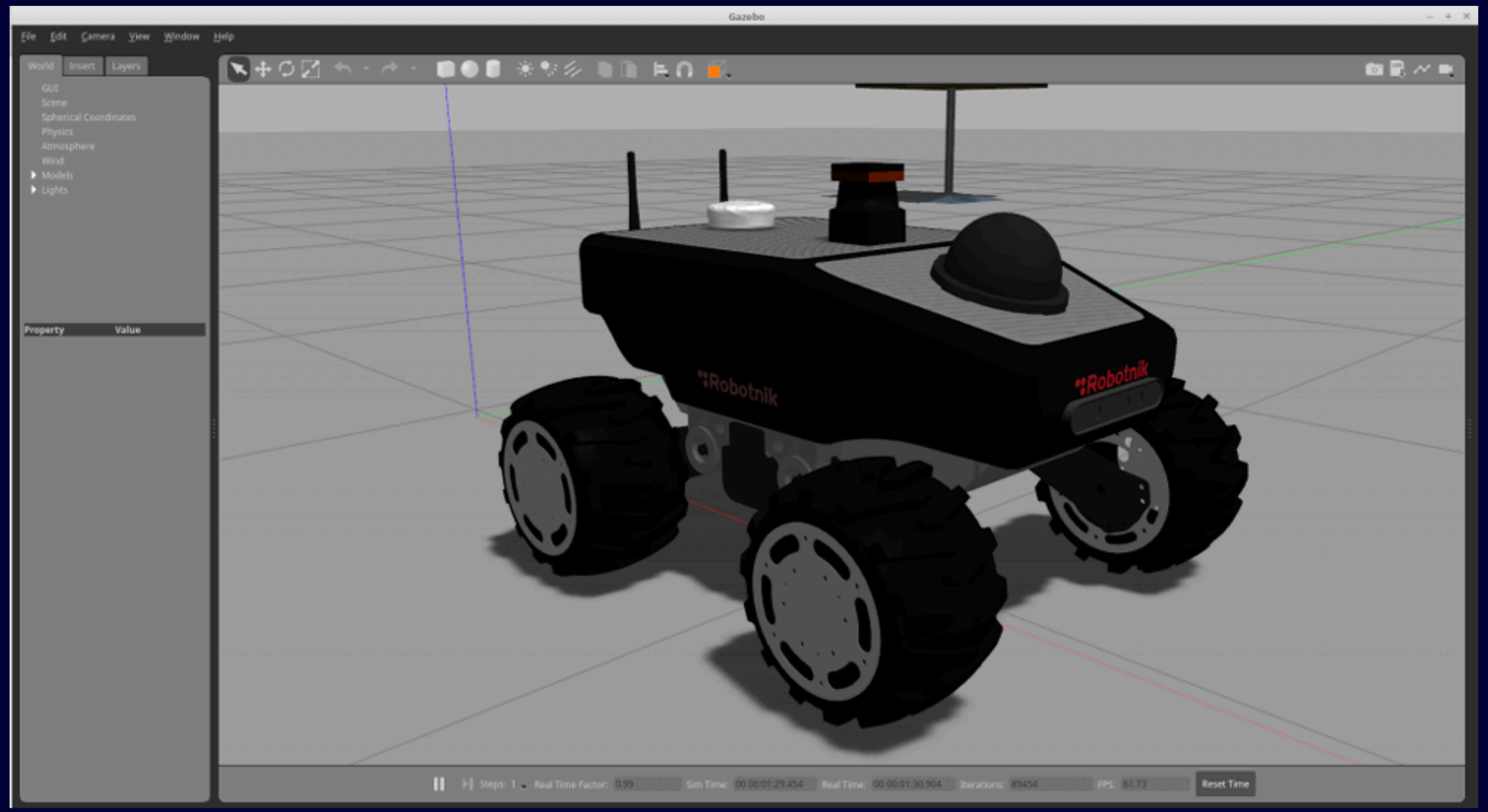
# Now it is possible to isolate developers from hardware (to a certain extent)

By using robot simulations (based on ROS)!

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A new type of developer

# Full Stack Robotics Developer

## Big three of the Full Stack Robotics Developer

1. **Has to be based on ROS**
2. **Has to be based on Web technologies**
3. **Has to be based on AI applied to robotics**

Fully Remote Job!

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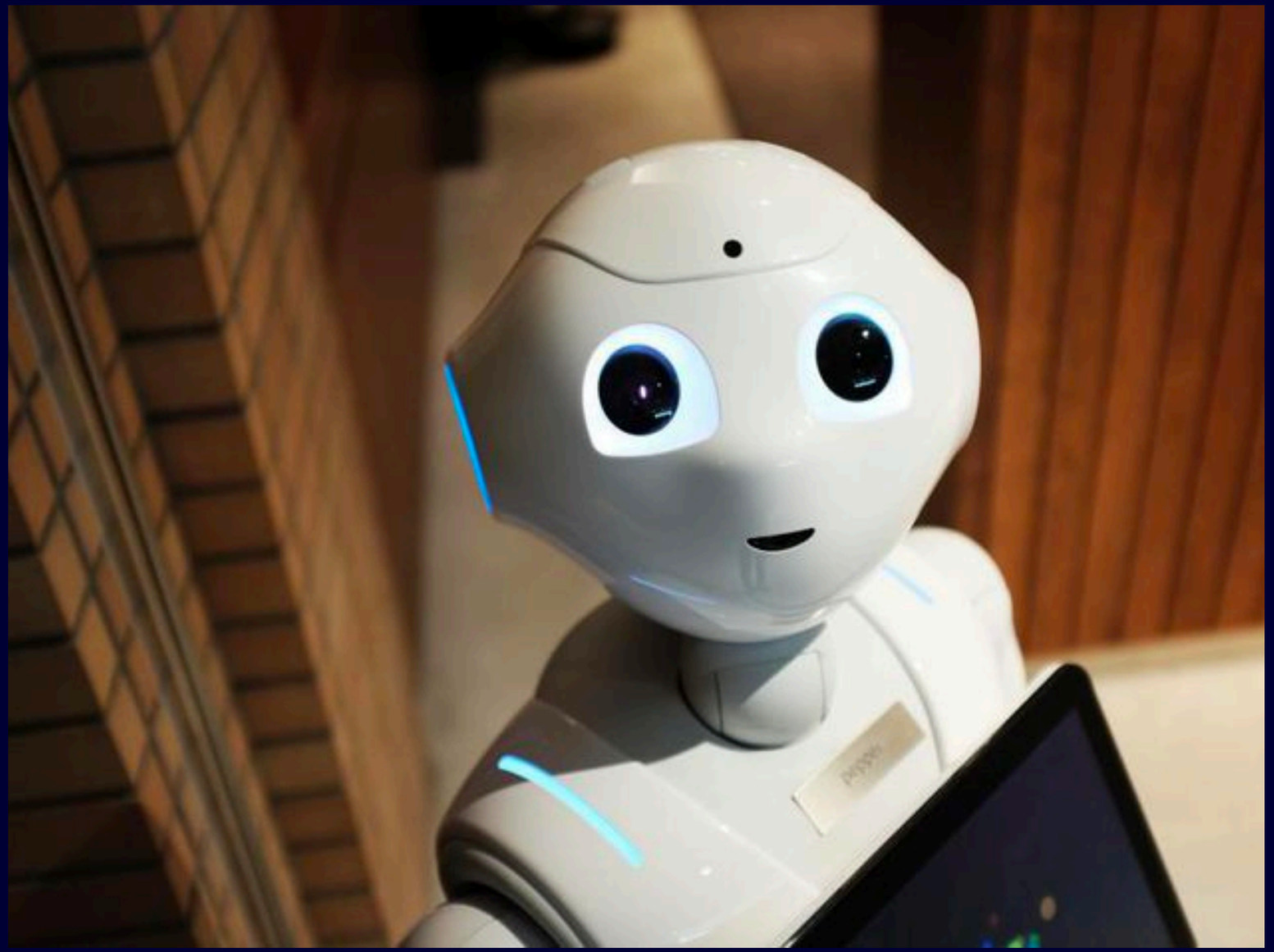
# 1. Based on ROS



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# Why based on ROS?

* ROS provides a common interface to any robot: programs can be shared

* ROS provides a common interface for real robot and simulated robot: you can develop in simulation

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# ROS at present

* Mostly used in academia and research
* Being used in many commercial robots
* By 2025, 50% of commercial robots will contain ROS

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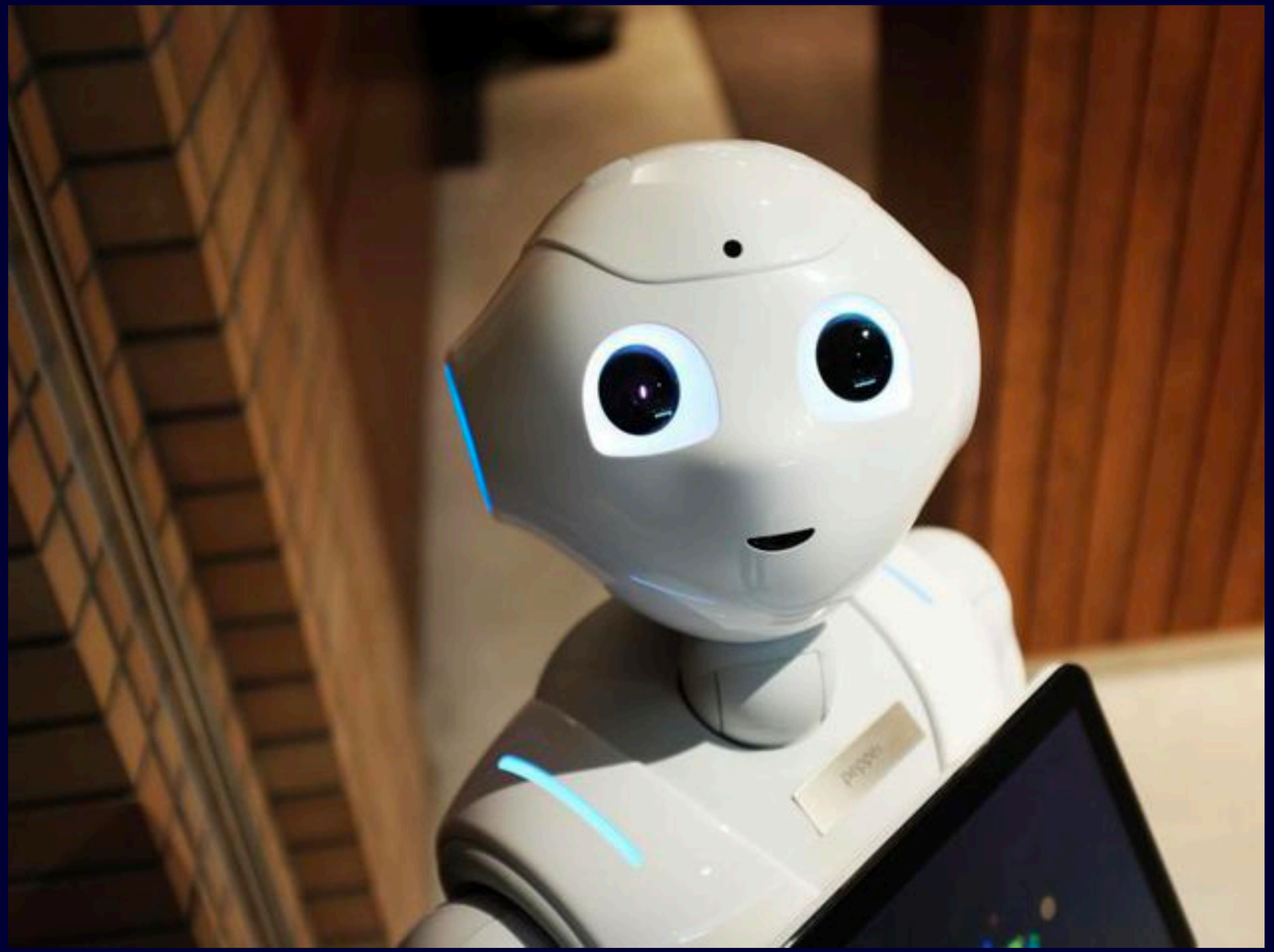
# 2. Web based



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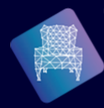
# Why web based?

* Universal interface for any device
* User needs to install nothing
* Simple usage interface for any user



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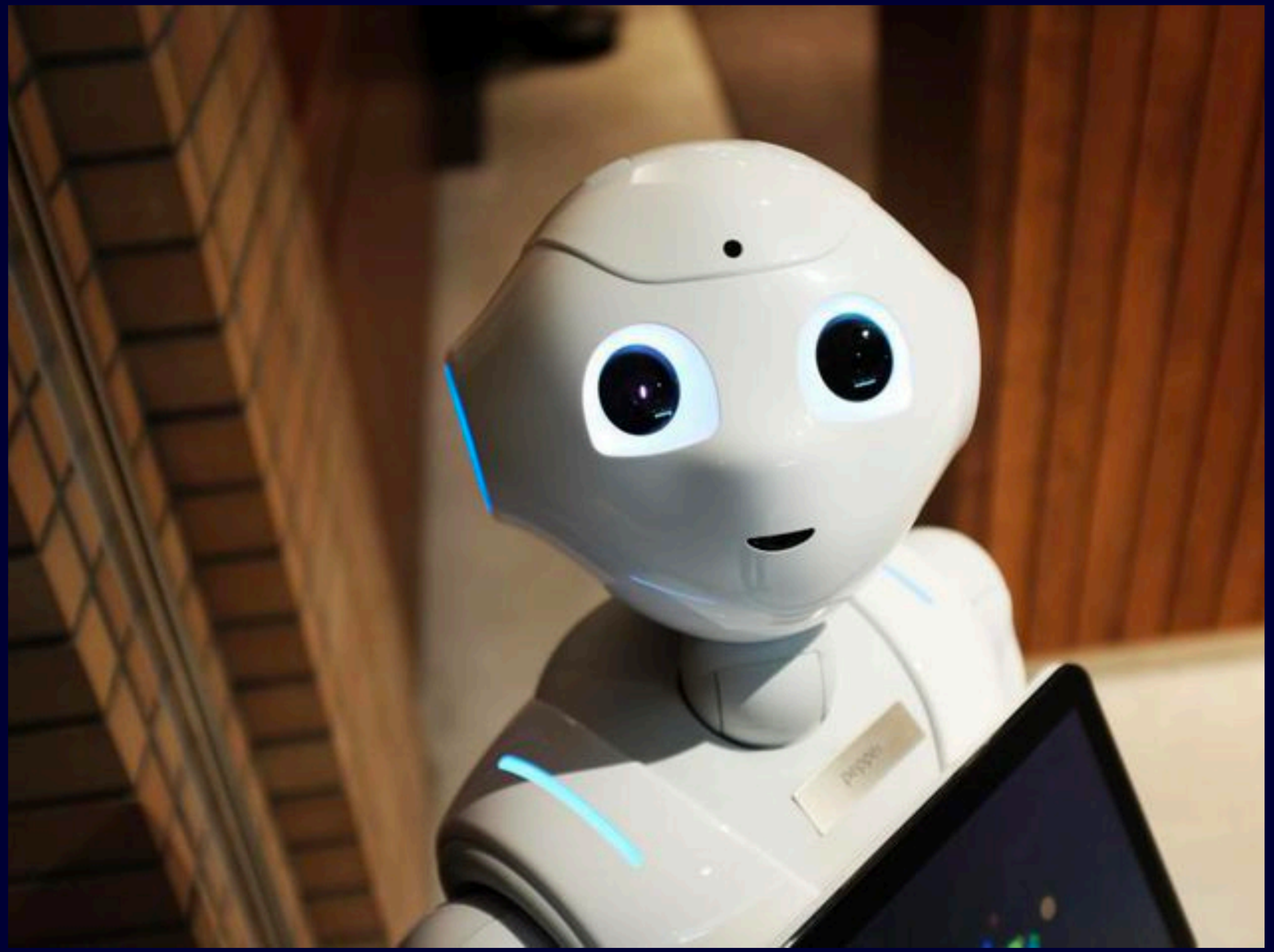
# 3. Based on AI for robots



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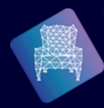
# Why AI for robots?

*** AI is the technology that can make robots intelligent enough to do the tasks**



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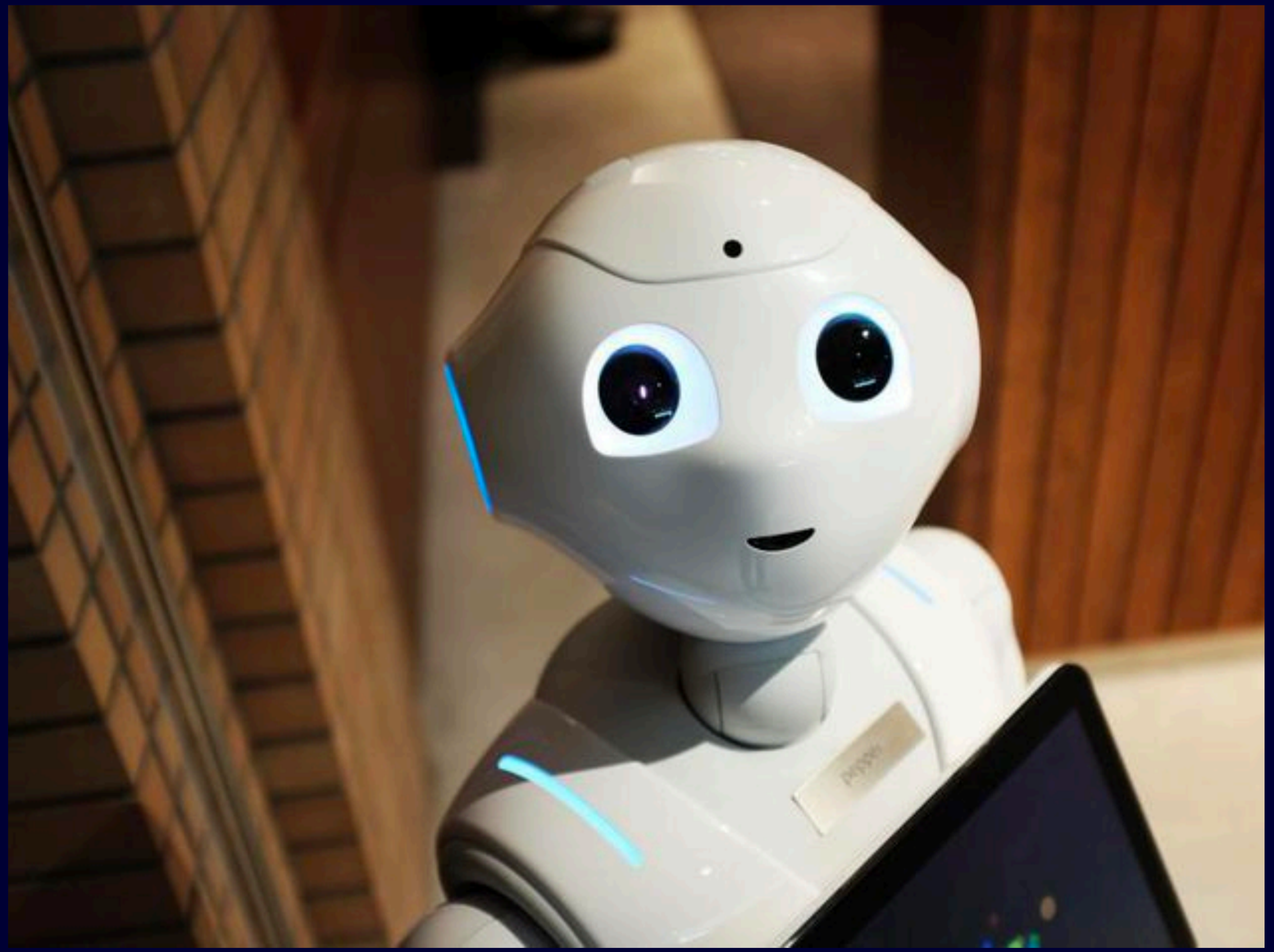
# Programming Languages



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# Which programming languages for robots?

* C++ for ROS development
* Javascript for Web interfaces
* Python for prototyping

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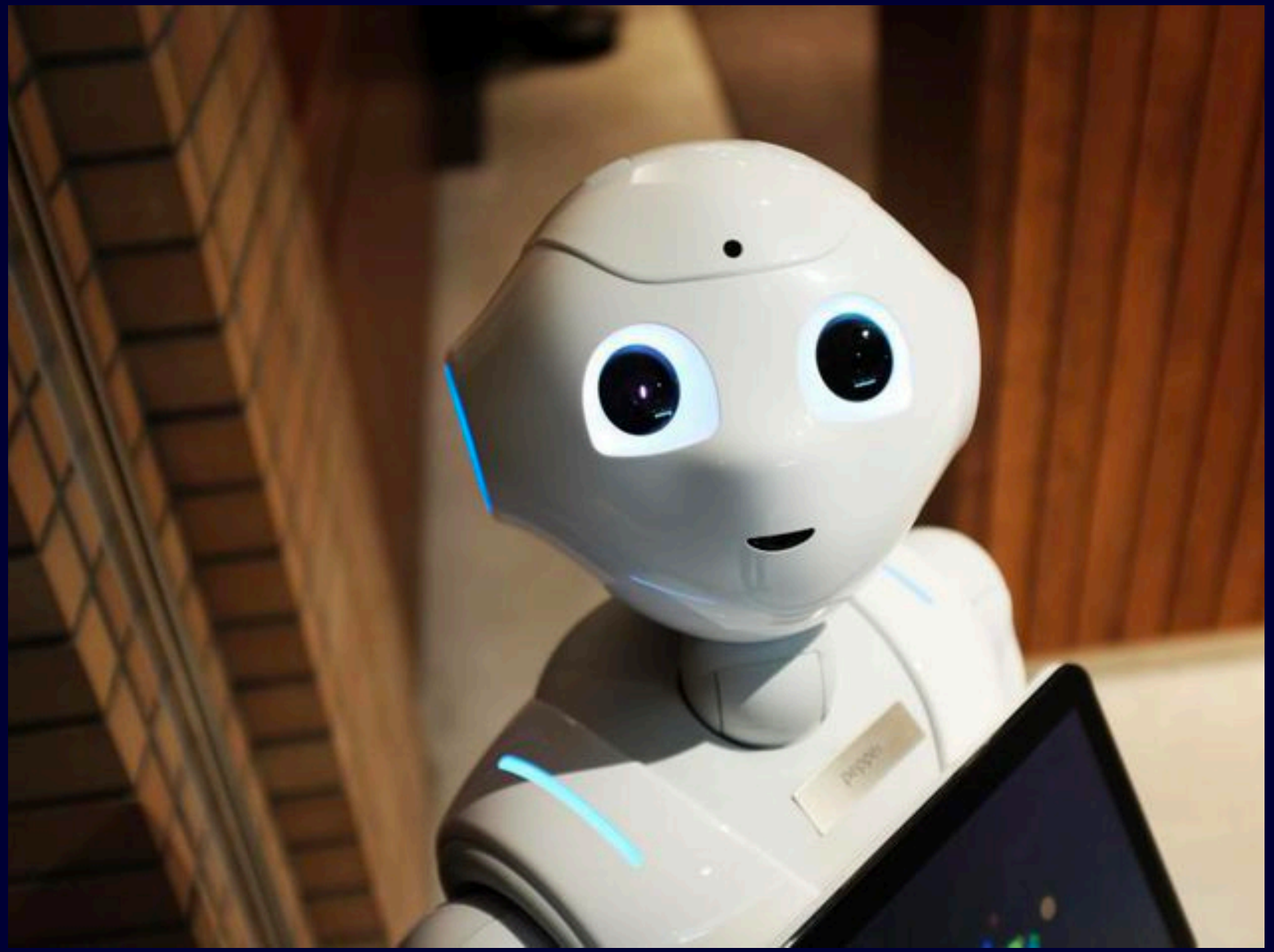
# Additional Subjects to Learn



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# Which other subjects to learn?

* Basic maths for robotics (algebra & probabilities)
* Robot kinematics
* Robot dynamics
* Robot motion and control
* Robot simulations
* Real Time Control

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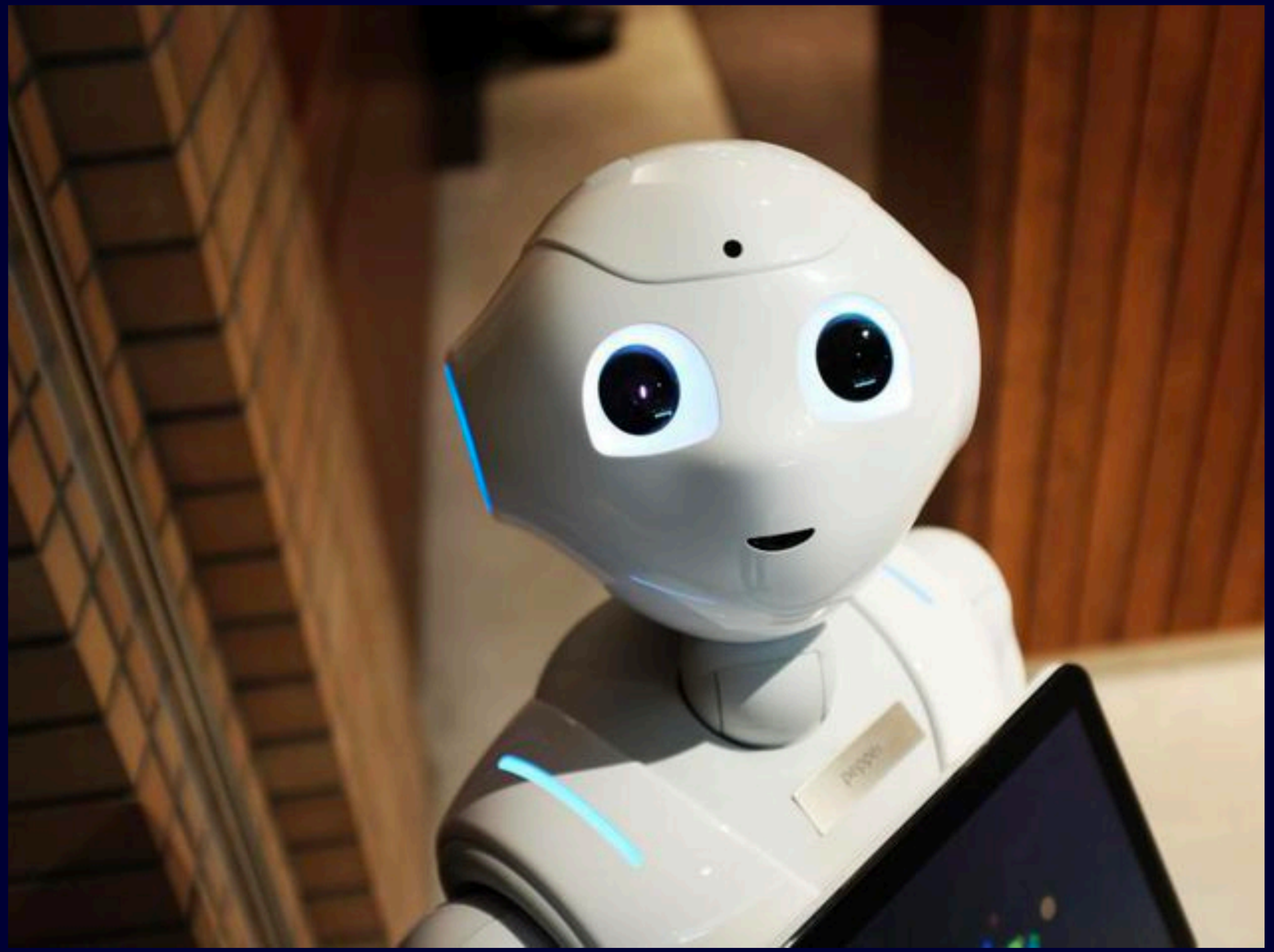
# Is simulation enough?



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# Is simulation enough?

*** No**

*** Use remote robotics labs**

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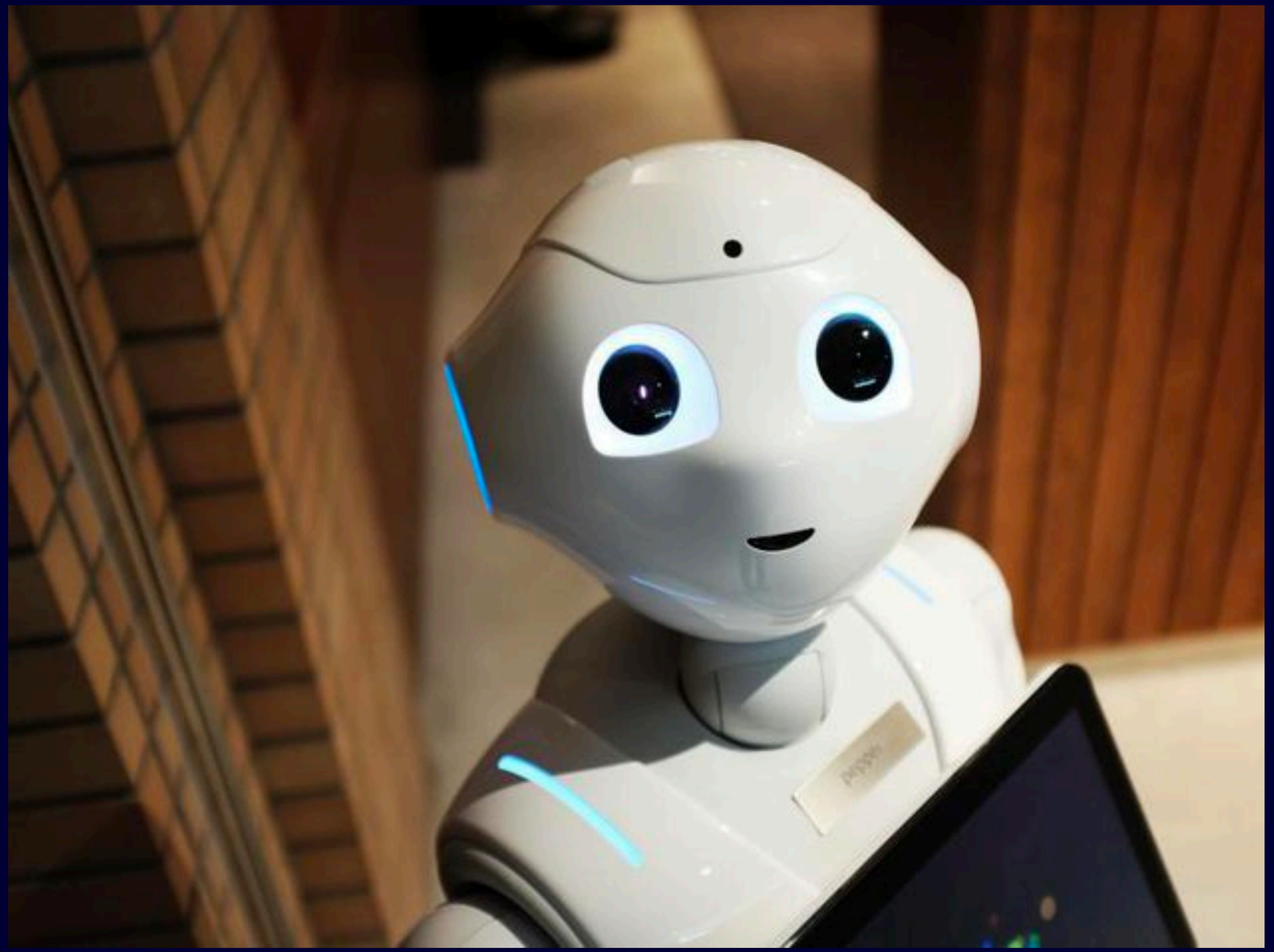
# How is the development procedure?



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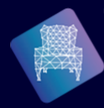
# Developing for robots as a Full Stack Robotics Developer

0. You start with an existing robot and its simulation
1. Create a Python prototype of your idea
2. Test it on the simulation
3. If ok, develop the whole application on C++
4. Test in simulation
5. If it works, test in real robot
6. If it works, build a web interface for end-users
7. Add continuous integration and testing based on simulations



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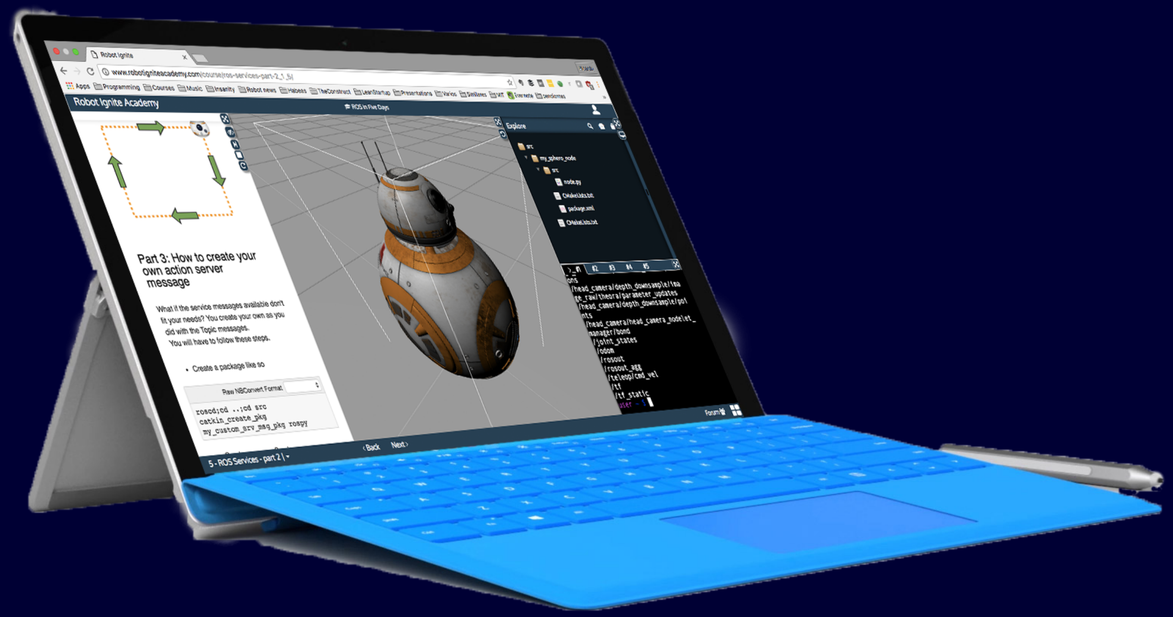
1. We need computer scientists to get intelligent robots
2. Full Stack Robotics Developer is a possible path
3. There are almost no competitors (at present)

# Conclusions

# In case you are interested in learning online

* Start at our academy

http://robotignite.academy

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# Free Online Courses to start:

1. **Linux for Robotics:** https://bit.ly/2PACycJ
2. **Python for Robotics:** https://bit.ly/3gzPKdR

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# Q&A

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