Robot Operating System (ROS)

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Biographical Sketch

Anis Koubaa is a Professor in Computer Science, and Leader of the Robotics and Internet of Things Research Lab, in Prince Sultan University. He is also R&D Consultant at Gaitech Robotics in China and Senior Researcher in CISTER/INESC TEC and ISEP-IPP, Porto, Portugal. He has been the Chair of the ACM Chapter in Saudi Arabia since 2014. He is also a Senior Fellow of the Higher Education Academy (HEA) in UK, and an ACM Distinguished Speaker.

He received several distinctions and awards including the Rector Research Award in 2010 at Al-Imam Mohamed bin Saud University, and the Rector Teaching Award in 2016 at Prince Sultan University.

According to the study carried out in Houcemeddine Turki, “Leading Tunisian Scientists in Mathematics, Computer Science and Engineering. An Overview” in GRIN Verlag, November 2105, he was ranked the 23rd most leading Tunisian scientists in the three areas combined of Mathematics, Computer Science and Engineering and the 6th scientist in the computer science disciple among all Tunisian scientists worldwide, as of 2014.

He is the Editor in Chief of the Robotics Software Engineering topic of the International Journal of Advanced Robotics Systems, Associate Editor in the Cyber-Physical Journal (Taylor & Francis). He is also the authors of six books with Springer on robots, sensor networks and Robot Operating Systems (ROS). He has been also actively participating in program committees of several international conferences including, ACM/IEEE International Conference on Cyber-Physical Systems, International Conference on Robotics Computing, European Conference on Wireless Sensor Networks, IEEE International Conference on Autonomous Robot Systems and Competitions, IEEE International Workshop on Factory Communication Systems. He is the author of more than 190 journal and conference publications, and one patent. He received several research grants as principal investigator, and he established research collaboration between Prince Sultan University and Gaitech Robotics for the development of robots and drones, and ROS.

His current research deals with providing solutions towards the integration of robots and drones into the Internet of Things (IoT) and clouds, in the context of cloud robotics. He has developed several real-world applications and prototypes such as Dronemap Planner, a cloud-based management system for drones and robots, and ROSLink, which is a messaging protocol for integration of Robot Operating System with the IoT. His research interests also include Robot Operating System (ROS), Robotic Software Engineering, Wireless communication for the IoT, real-time communication, safety and security for cloud robotics, intelligent algorithms’ design for mobile robots, and multi-robot task allocation.

Prof. Anis Koubaa has conducted several trainings around drones and robots.

Keywords (Robot Operating System (ROS))

Abstract— Robot Operating System (ROS)

Robot Operating System (ROS) becomes nowadays the de-facto standard for developing robotics applications. The first version of ROS was released in 2010 and nowadays ROS becomes the largest ecosystem and platform for robotics software development. In just a few years of its release, ROS has witnessed a huge community with increasing number of users and developers from academia and industry, as well as hobbyists.

ROS is used in the development of any kind of robots, including drones.

In this tutorial, I will present the basic concepts of ROS and how it can be used to program and develop applications for drones. We will demonstrate sample code to control drones and the most relevant simulation models of drones in ROS.