ROSCon FR&DE 2025

WORKSHOPS

Workshop Title	Introduction to Model-Based Design (MBD) for ROS2
Name of principal instructor	Daniele Sportillo
Number of supplementary instructors	2
Maximum of participants	20
Language	English
Workshop duration	4h
Required material	Personnal laptop with : 1. at least 16GB of RAM and 32GB of storage (SSD is highly recommended) 2. Ubuntu 24.04 (Docker are not allowed)
Skills required for participants	■ To understand the content of the official ROS 2 Jazzy tutorial (https://docs.ros.org/en/jazzy/Tutorials.html) up to "Beginner: CLI tools" ■ To take Introduction to MATLAB (https://matlabacademy.mathworks.com/jp/details/matlab-onramp/gettingstarted) and Introduction to Simulink (https://matlabacademy.mathworks.com/jp/details/si

Brief description	Model-based design (MBD) is a development method in which the development target is expressed in mathematical formulas and other models, and simulations are used to design and verify it.
	In conventional development centered on actual machine verification, there was a problem that the discovery of defects was biased towards later processes, resulting in high correction costs.
	The use of MBD makes it possible to check for defects by simulation from the early stages of development, and has the advantage of being able to correct defects at an early stage. MBD has been mainly used in the field of control design, but in recent years it is expected to be used in the field of robotics. Using MBD in the context of ROS 2 is then becoming increasingly important.
	In this workshop, students will learn the basics of MBD, modeling mobile robots, virtual prototyping and verification using Model In the Loop Simulation (MILS), and a series of development workflows for parallel execution (SILS/RCP/HILS) in conjunction with ROS 2.
	MATLAB and Simulink are used as development tools, and MathWorks engineers will be instructors. The following tools will be used for this workshop material: ■ Using the simulator (planned to be built with ROS 2 Jazzy + Gazebo Harmonic) ■ MATLAB R2025a (1-month trial available)