



Dipartimento di
Elettronica
Informazione e
Bioingegneria

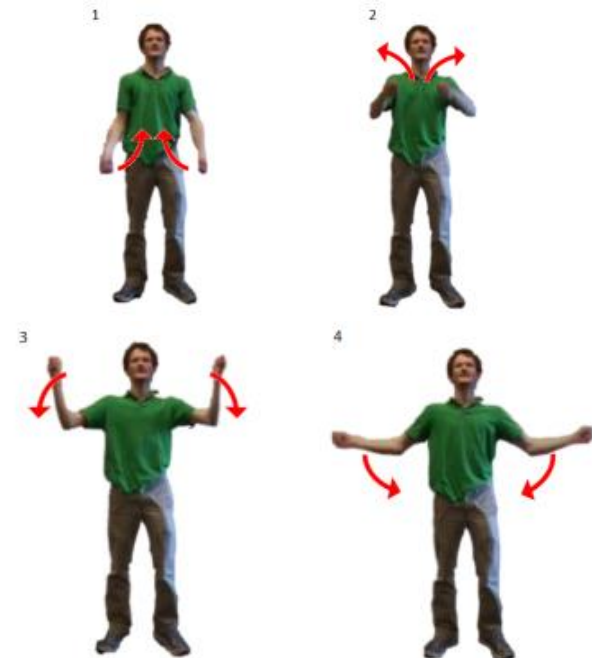
 POLITECNICO DI MILANO



Cognitive Robotics

Projects 2015

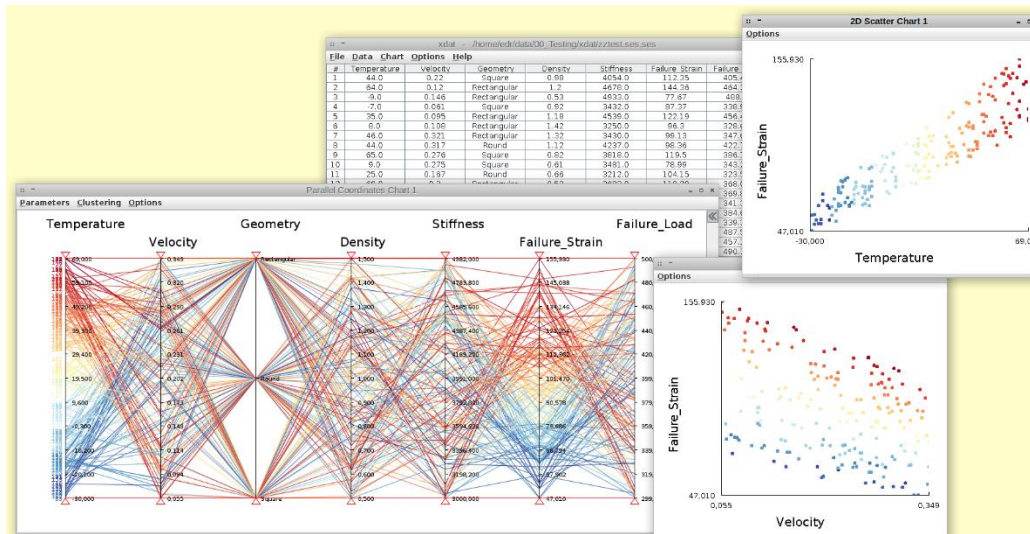
- **Area: Developmental Robotics**
- **Task:**
 - NAO robot to reproduce human gestures
- **Tools:**
 - Kinect, NAO robot
- **Implementation:**
 - human gestures recognized by kinect, transformed into NAO model, executed on NAO





Parallel coordinates

- Task:
 - study the method for representing multi-dimensional data on a plane and try the free software XDAT (www.xdat.org)
- Tools:
 - XDAT
- Expected output:
 - how to use the tool for robotics applications, as C-space representation, trajectory computation, vision features, etc





- Task:
 - Build a differential robot based on existing HW
- Tools:
 - Custom robot, Modular HW available, ROS middleware
- Implementation:
 - Assemble the robot
 - Configure electronics
 - Build basic ROS nodes
 - Control the robot via joypad

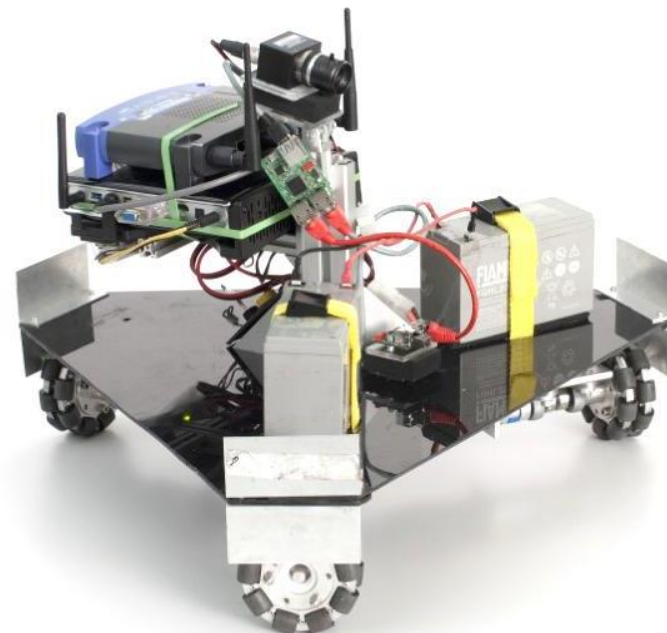
ROS





- Task:
 - Build an omnidirectional robot based on existing HW
- Tools:
 - Custom robot, Modular HW available, ROS middleware
- Implementation:
 - Assemble the robot
 - Configure electronics
 - Build basic ROS nodes
 - Control the robot via joypad

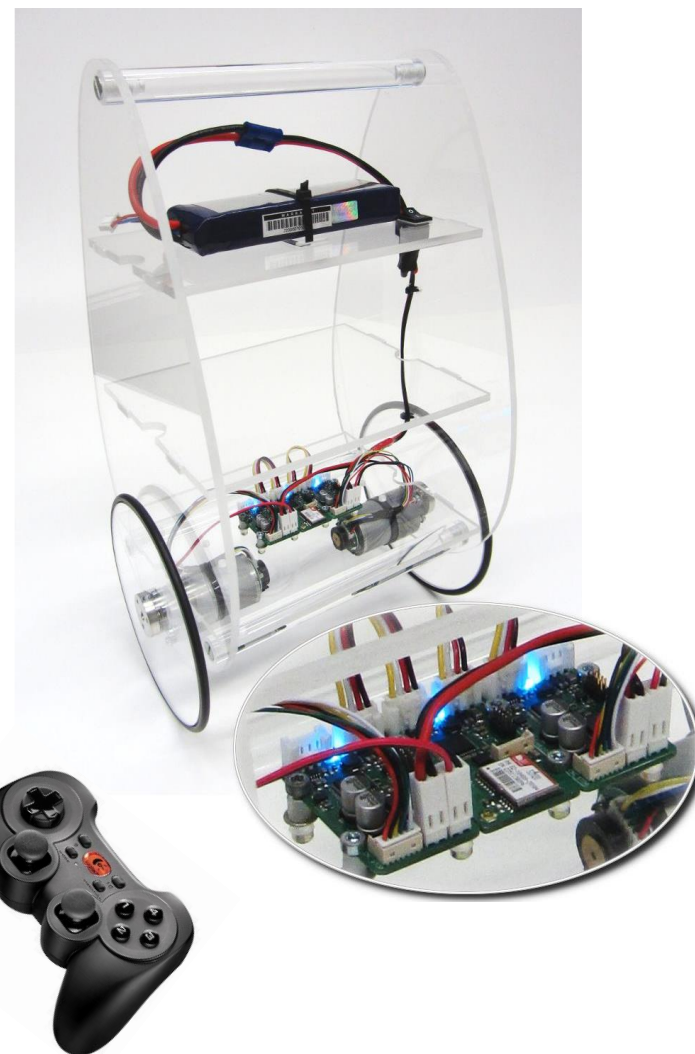
ROS





- Task:
 - Build a balancing robot based on existing HW
- Tools:
 - Custom robot, Modular HW available, ROS middleware
- Implementation:
 - Assemble the robot
 - Configure electronics
 - Build basic ROS nodes
 - Control the robot via joypad

ROS

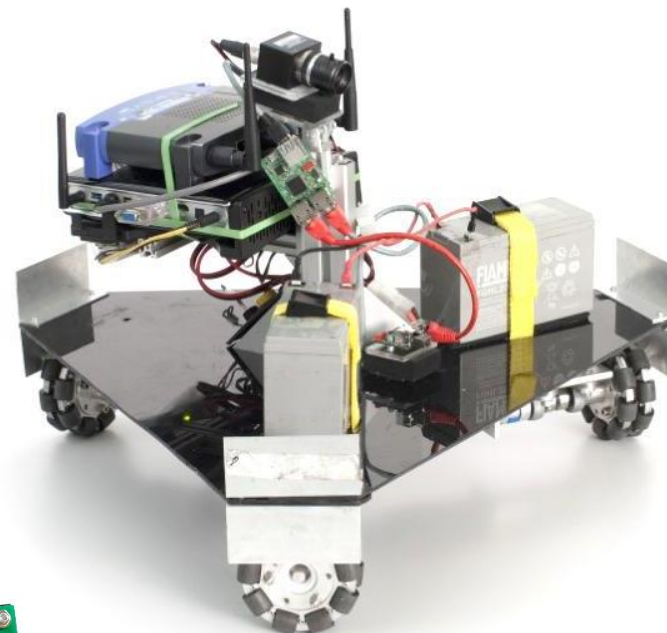




3D Robot Joypad

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- Task:
 - Build a novel joypad for holonomic robot control
- Tools:
 - Custom HW (joystick, LCD, Arduino?), ROS middleware, holonomic robot
- Implementation:
 - Assemble the HW
 - Program the logic
 - Build basic ROS nodes
 - Control the robot via joypad



ROS





- Task:
 - Build some automatic robot benchmarking tools
- Tools:
 - ROS middleware, ROS Bags, Matlab
- Implementation:
 - Study RoCKIn logging tools
 - Develop automatic scoring tool from RoCKIn bags
 - Navigation and Perception oriented benchmarking





- Task:
 - Develop the localization module of the Kobra robot
- Tools:
 - ROS middleware, ROAMFREE
- Implementation:
 - Study ROAMFREE library
 - Study ROS Navigation stack
 - Integrate the ROAMFREE + Navigation stack on the Kobra platform

