Tutorial 4 intro:
DexROV: Teleoperation of a simulated ROV and arm

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ISME in brief

Italian interuniversity center

- Nodes:
  - Ancona
  - Bologna
  - Cassino
  - Cosenza
  - Firenze
  - Genova
  - Lecce
  - Pisa
  - Roma Sapienza

ISME
Integrated Systems for Marine Environment

ISME in brief

- Sea-Lab:
  - Joint Italian Navy/ISME located in La Spezia
  - No need of advance area clearance
  - Availability of Navy support personnel
  - Some restrictions

ISME in brief

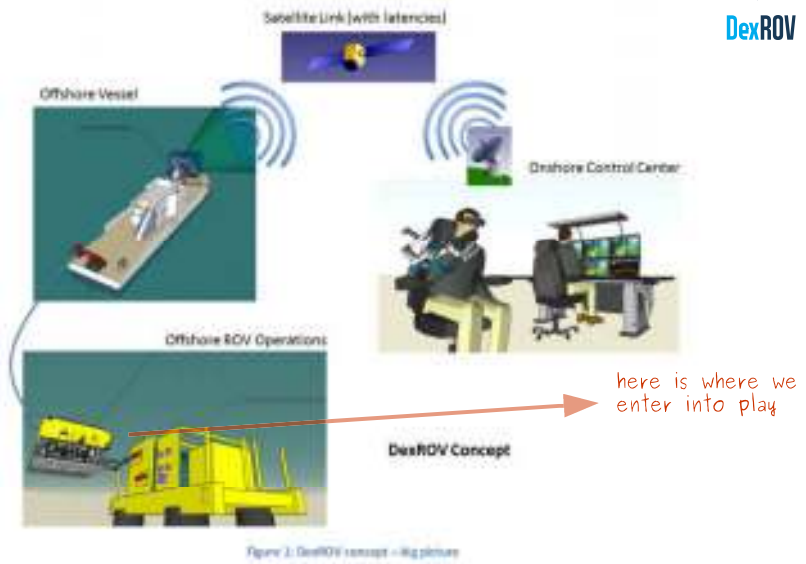
- involved in a number of European projects and technology transfer since 1999:

WiMUST
ARROWS
TRIDENT
CO3AUVs
SUONO
VeNUS
MARIS

ISME in brief

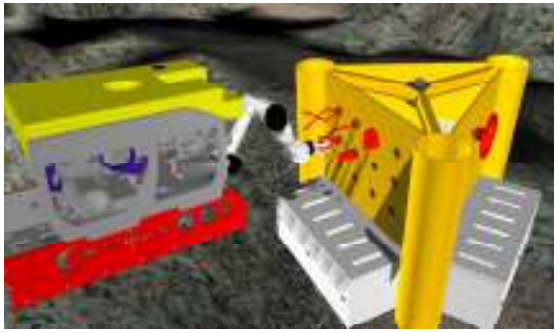
- Running H2020 projects:
  - WiMUST formation control, cooperative navigation
  - DEXROV manipulation, time-delay control
  - ROBUST manipulation
- In 2018:
  - EUMR, EUropean Marine Robotics. H2020 Infrastructure
  - small project with Qatar + technology transfer

The DexROV picture (i'm not going to repeat dexROV again…)

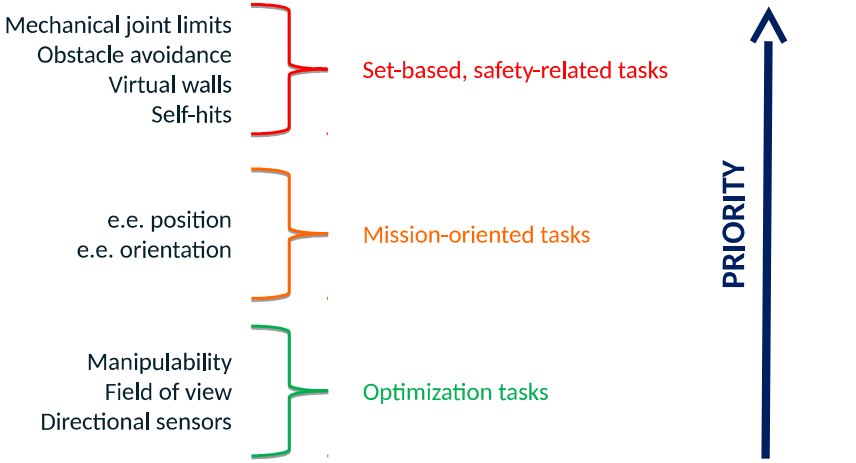


Simple inverse kinematics…

- **Objective**: we receive end-effector desired movements and output reference joint velocities in real time guaranteeing
  - cartesian constraints
    - self-hitting
    - obstacles
    - dexterous workspace
  - mechanical joint limit
  - joint speed limits
  - kinematic singularities
  - any optimizzation?



Simple inverse kinematics…



Simple inverse kinematics…

The mockup panel

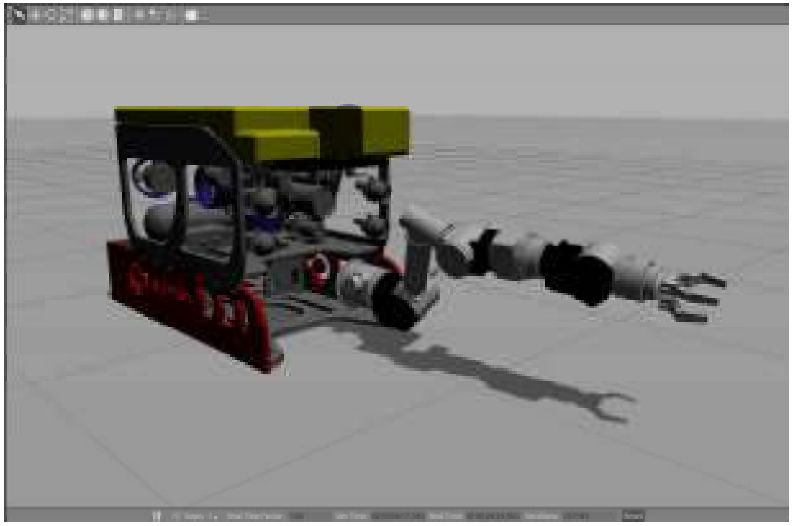
Some numerical simulations

Video: panel_sim01-panel_sim04

Preliminary experimental results

Video: ICRA_DexROV

The “real” experts…

Detail on the implemented algorithm in the following tutorial/demo

Questions?