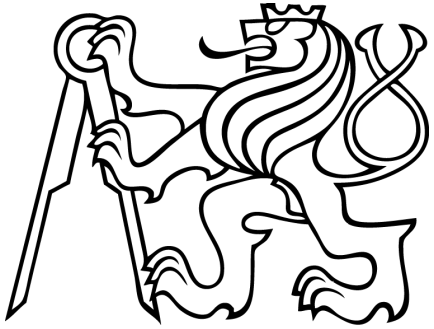


What we've learned.

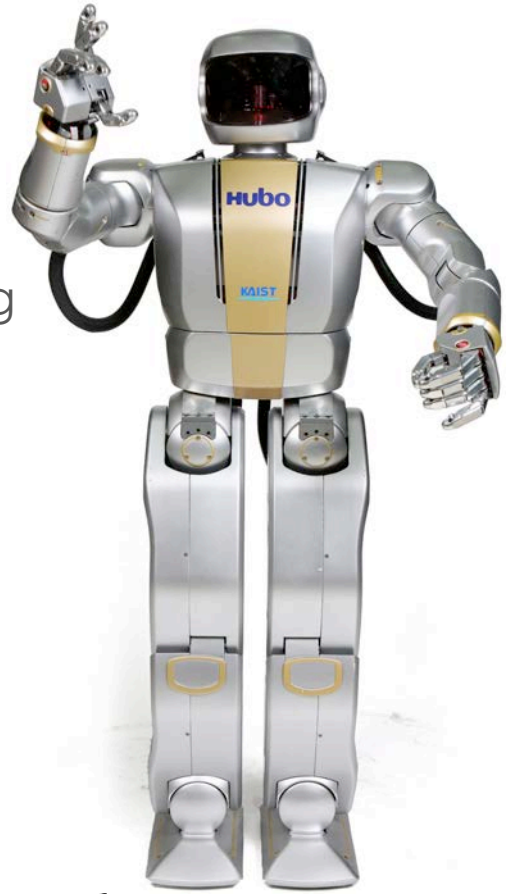
A collaboration between Czech Tech and Drexel

Alex Alspach & Sean Mason
Drexel University

alexalspach@gmail.com
seanmason337@gmail.com

Why are we here?

- Online HUBO
  - Our lab, Drexel Autonomous Systems Lab
  - Regli's Lab, Applied Comm. And Info. Networking
- We are developing a system that will allow universities without a HUBO to test their ideas in a safe and secure environment.
- We have learned a few things.



Accessibility

- Online registration
- Time slot reservation
- SVN account on server
- Worldwide access

Availability

- Web-based availability
  - Arena and robots
- Robot walks itself out to the workspace for the reservation
- Self charging

Adaptability

- More sensors – more uses
- Dynamic environment
  - Obstacles can be added
- Multiple task workstations
  - Stations for grasping, stair climbing
    - Stations must be reset each time
  - Automatically walk to station

User Interface

- Sensor data visualization tools
- Full positional feedback
  - We already have a motion capture system
- Ability to easily add obstacles or change/ reset the environment
  - e.g. Mirek's click and raise plugin

Safety

- Gantry to lift and reset after failure
- Soft limits at arena extents
- Collision detection and avoidance
- HUBO will walk to reserved station
  - And back to the dock at the end

Software

- HUBO ROS package
  - Document how to communicate
  - sensor data visualization and logging
- Simulator integration
  - Streamline development and testing
- Ability to run code on server or on client.
- Ability to run code on HUBO for real-time applications

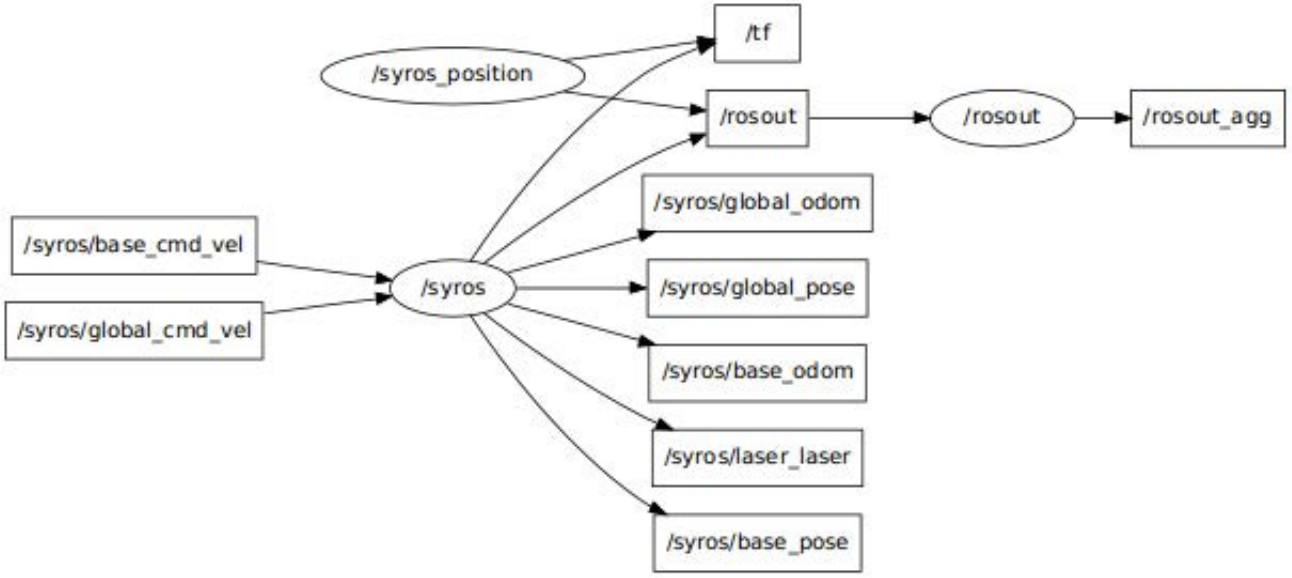
Documentation

- Installation guide
- Demonstrative example code
  - Presented in multiple language
- Courses
  - Beginner problems to be solved
  - Solution implementation

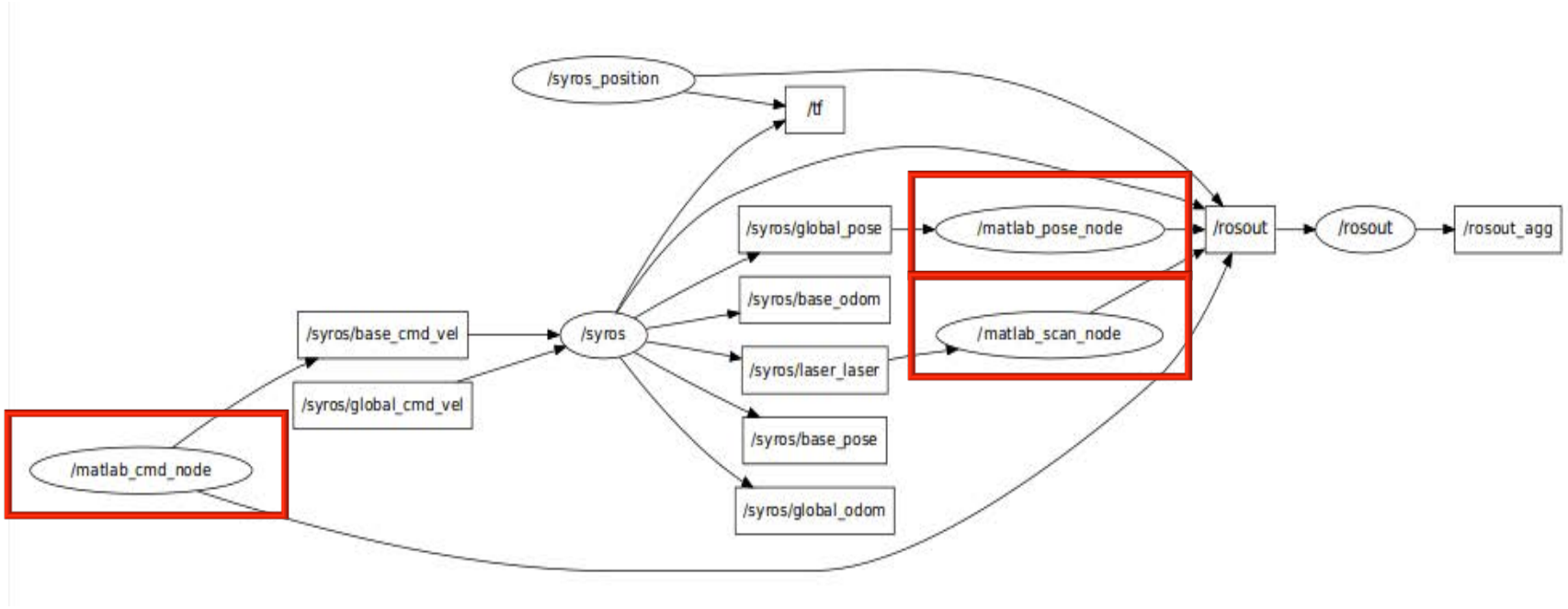
SND Implementation

- Communication via IPC Brige

ROS – Syrotek Node Tree



ROS – Syrotek – Matlab Node Tree



Documentation of our work

- SVN has been updated and contains
  - IPC-Bridge package
  - ROS-Syrotek-MATLAB ROS Package
  - Launch files to establish communication
  - MATLAB files to speak to ROS
  - SND code
  - README files
- Final Report
  - Uploaded to our Wiki
  - PDF