



Starting up from zero: Using ROS in the Amazon Robotics Challenge

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Development



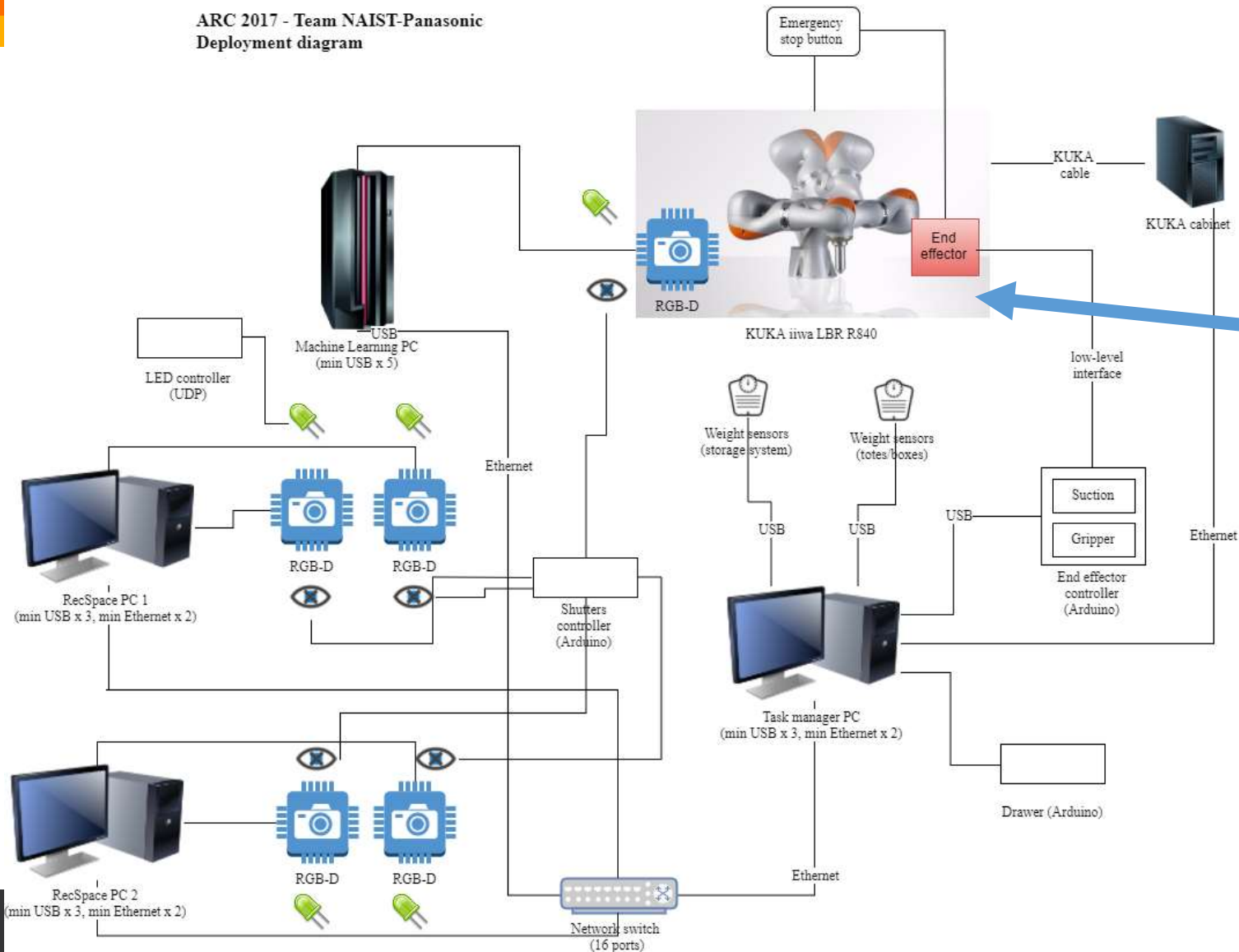
- Team of mechanical & electrical engineers, only 1 CS person (initially)
- No prior ROS experience
- Practical Linux, C++, Python experience

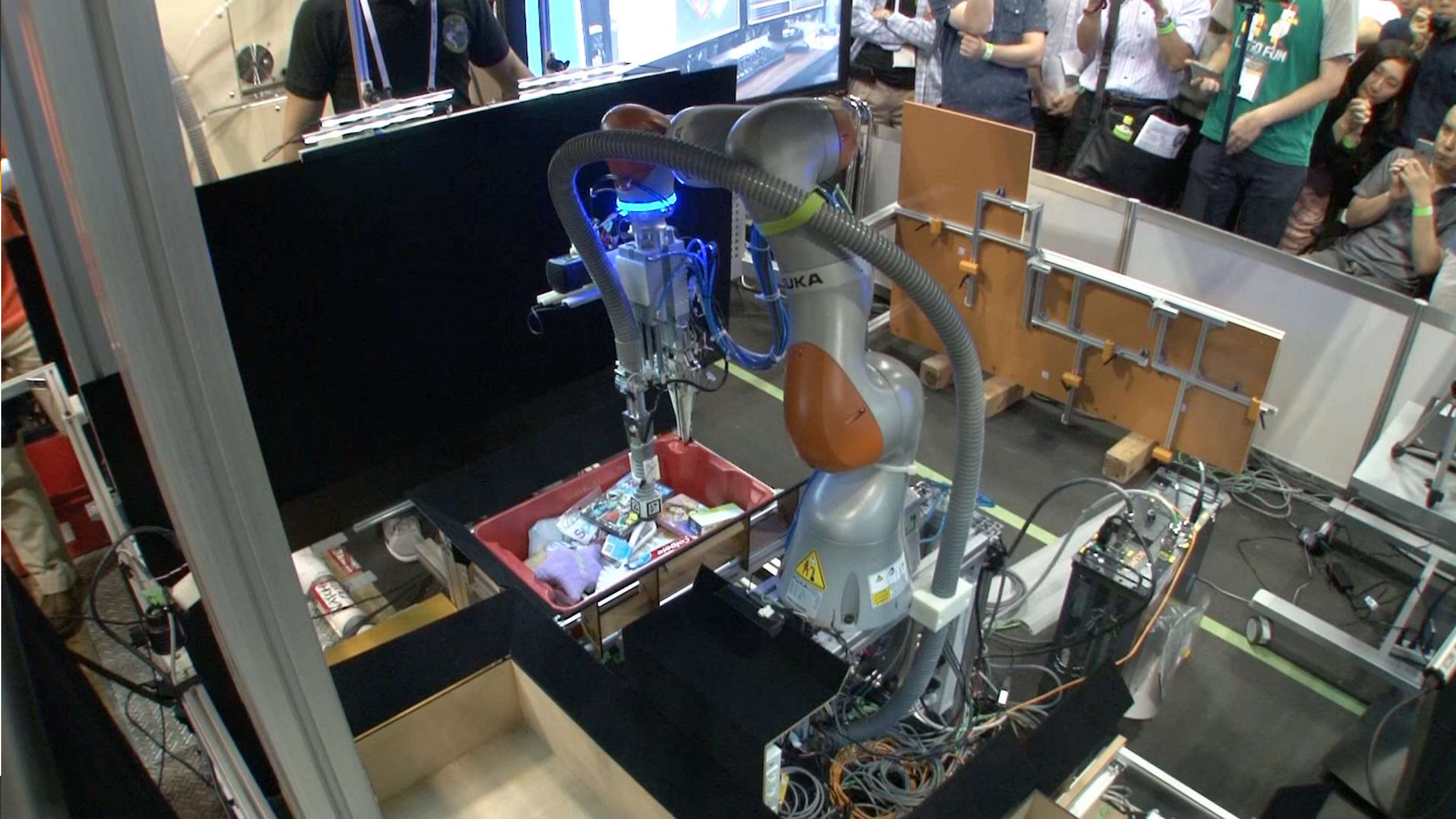
- Start in February, finish in August (7 months total)
- Finished in 6th place



System structure


ARC 2017 - Team NAIST-Panasonic
Deployment diagram





Lessons 1/3



- Feedback about node state was desired
 - Lifecycle in ROS2 
- Many ROS Answers posts tend to go "It's in the manual"
 - Save unsatisfying answers when you find them, **then improve them**
 - Keep documentation & answers comprehensive
 - Show compassion for non-CS users

Lessons 2/3

- Visualization helps debugging (!!). GUIs are undervalued



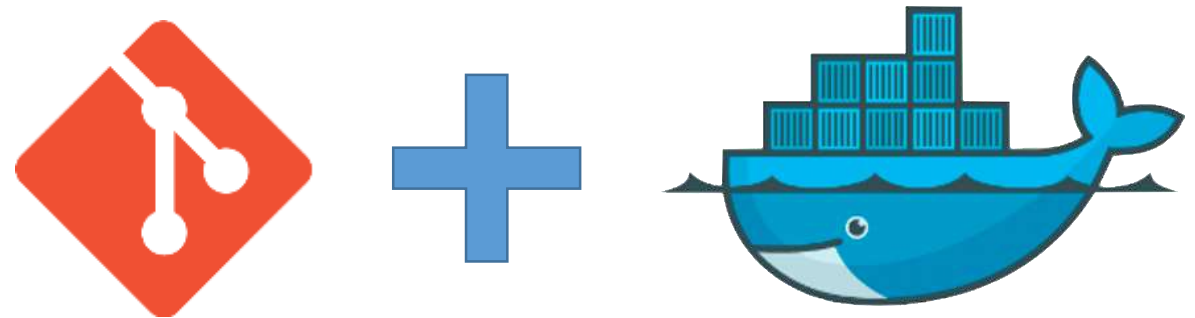
The screenshot displays a complex GUI for a robot system. It is divided into several sections:

- Top Left:** A 3D camera view of a red tray containing various items, with a red bounding box around the tray and some numerical data at the bottom.
- Top Middle:** A grid of four smaller camera views labeled C, B, L, and R, showing different perspectives of the robot's environment.
- Bottom Left:** A top-down occupancy map showing the robot's path and the layout of the tray. It includes a red bounding box and a scale bar.
- Bottom Middle:** A list of tasks and their durations:
 - 2.8s P4: GoToContainer
 - 0.9s P3: GoToLookIntoContainer
 - 0.3s P2: UpdateOccupancyMap
 - 2.5s P1: DLRecognizeItems
 - 146.6s RetrievalItem
- Bottom Right:** A list of navigation nodes:
 - N1-1: GoToContainer
 - N1-2: RetrievalItem
 - N1-3:
- Far Right:** A panel of system metrics:
 - Crowdiness: 0.15
 - Num_of_failed_attempts: 1
 - num_of_failed_attempts_in_a_row: 1
 - hard_mode: 1
 - length dl candidates: 3
 - length surface blacklist: 0
 - length surface candidates: 0
 - length surface blacklist: 0
 - candidate_came_from_DL: 0
 - candidate_came_from_surfaces: 0
 - No 0
 - Successfully retrieved item. Delivering.
- Bottom Bar:** A status bar showing:
 - 905.8s
 - Executing tnp_kuka_motion/sweepToteHorizontal
 - Executing the service

Lessons 3/3



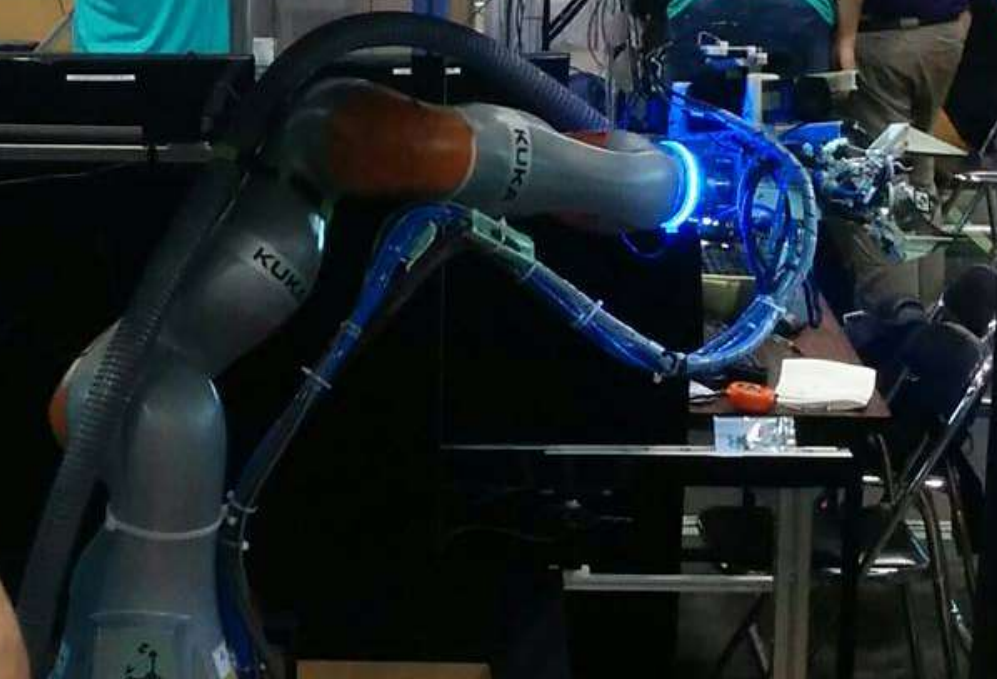
- Docker & git save lives



ToDo:

At 10:15, run:
rm -rf *

At 12:30,
score 80 points



Lessons 4/3

Get help!!



ROS Japan Usergroup

- 400+ members
- 12 past meetup events
- <https://rosjp.connpass.com>
- <https://discourse.ros.org/c/local/japan>
- Docker Images!

• → Yutaka Kondo

ROS Japan UG
ROS (Robot Operating System) Japan Users Group

Group Description
ROS (Robot Operating System) Japan Users Group

Members (369)

Organizer

Other Members

Link

Media (25)

Upcoming Events

- ROS Japan UG #14 International Meetup (29/44人)
- ROS Japan UG #13 移動ロボット勉強会 (129/45人)

