



ROS-I Training Class

BASIC DEVELOPERS' TRAINING CLASS

February 13 – 15, 2017

Presented by Southwest Research Institute





INTRODUCTIONS: SWRI





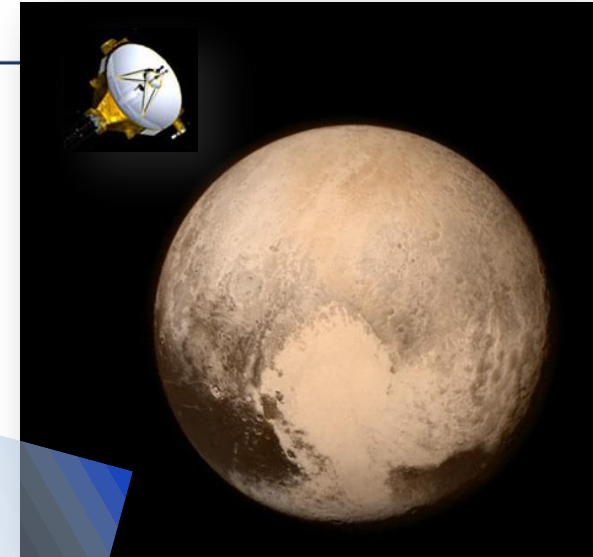
SwRI: Deep Sea to Deep Space

**Independent.
Advanced Science.
Applied Technology.
From *Deep Sea*
To *Deep Space*.
And Everything in between.**



■ Alvin

- Tested at SwRI before first (1964) record-setting dives > 8,000 ft.
- Redesigned (2013) new Alvin (3" titanium sphere) capable of > 21,000 ft.



■ New Horizons

- SwRI-lead
- Launched: Jan. 19, 2006
- Closest approach to Pluto: July 14, 2015
- Fastest spacecraft ever: ~30,000 mph





SwRI: Deep Sea to Deep Space

And Everything Between!

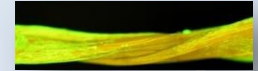
Spacecraft &
Planetary
Sciences



Energy



Robotics,
Automation, and
Simulations

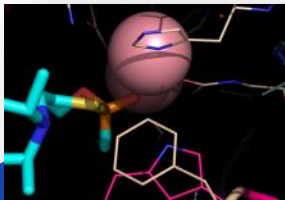


Regenerative
Medicine

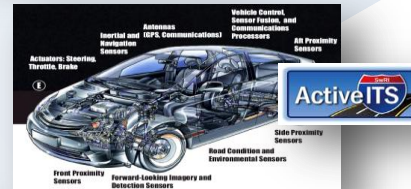
Lubricants
Testing



Pharmaceuticals &
Bioengineering



Materials &
Engineering



Infrastructure
Communications

Engine Design and
Optimization



Water and
Geological
Engineering





INTRODUCTIONS: INSTRUCTORS





Instructors



Jeremy Zoss



Levi Armstrong





INTRODUCTIONS: OTHER SWRI PERSONNEL





Contact Info



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Daily Schedule, Wiki & Github (Slides, Exercises)

CLASS LOGISTICS: AGENDA AND NAVIGATION





Monday Agenda



- 0730 VM Check
- 0830 Introductions and Agenda
- 0900 Installing ROS, ROS Packages
- 1015 Break
- 1030 Parameters, Topics, Messages
- 1200 Lunch
- 1300 Services, Actions
- 1430 Break
- 1445 Launch Files, TF
- 1630 Lab and Campus Tours
- 1800 Group Dinner at La Gloria





Tuesday Agenda



- 0830 URDF, Intro to MoveIt!
- 1000 Build a MoveIt! Package...
- 1200 Lunch – Intro to ROS-I
- 1300 MoveIt! in RViz, MoveIt! in C++
- 1445 Motion Planners (Descartes)
- 1545 Break
- 1600 Perception
- 1630 Wrap up
- Dinner with ROS-I Team





Wednesday Lab Agenda



- 0815 Review of Labs
- 0830 Labs
 1. Pick and Place Application
 2. Descartes Demo
 3. MoveIt! Demo
 4. Perception Application
- 1130 Wrap Up (Surveys)



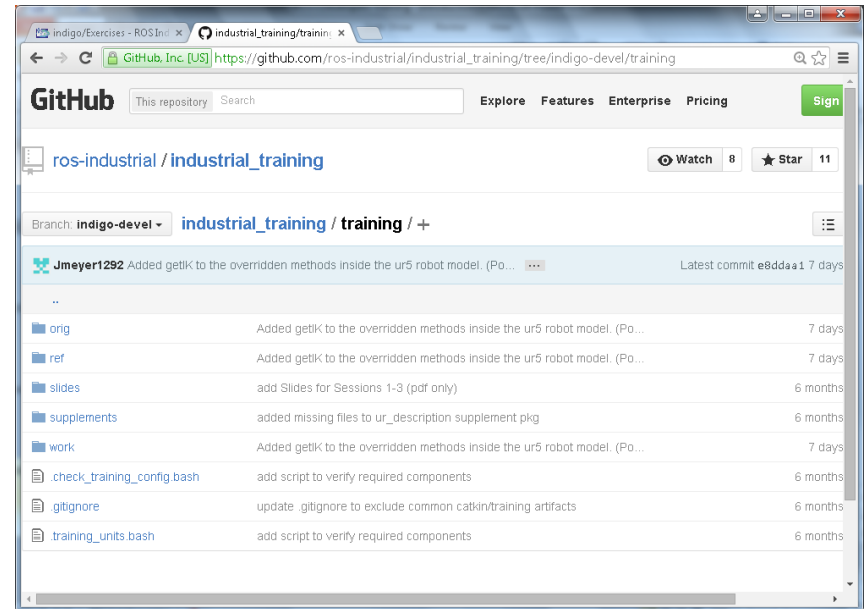
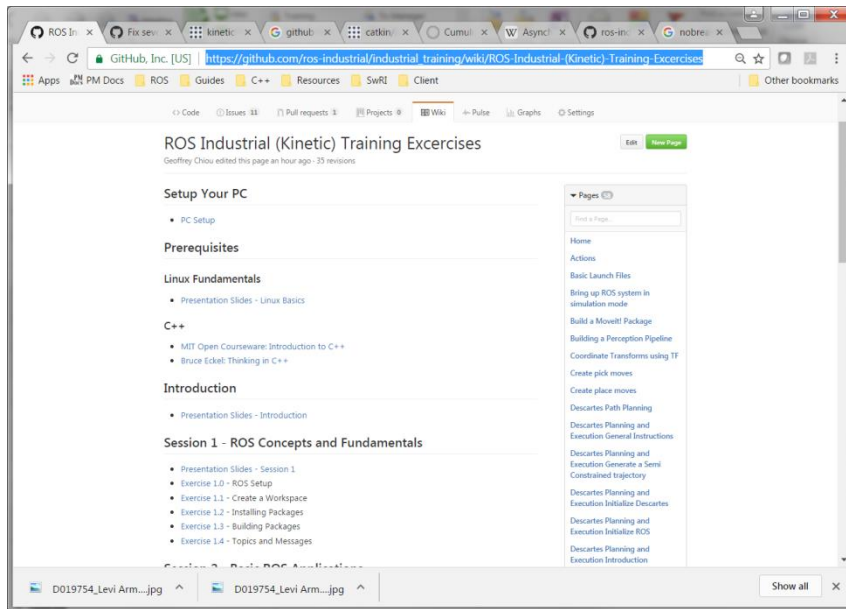


Wiki & Github



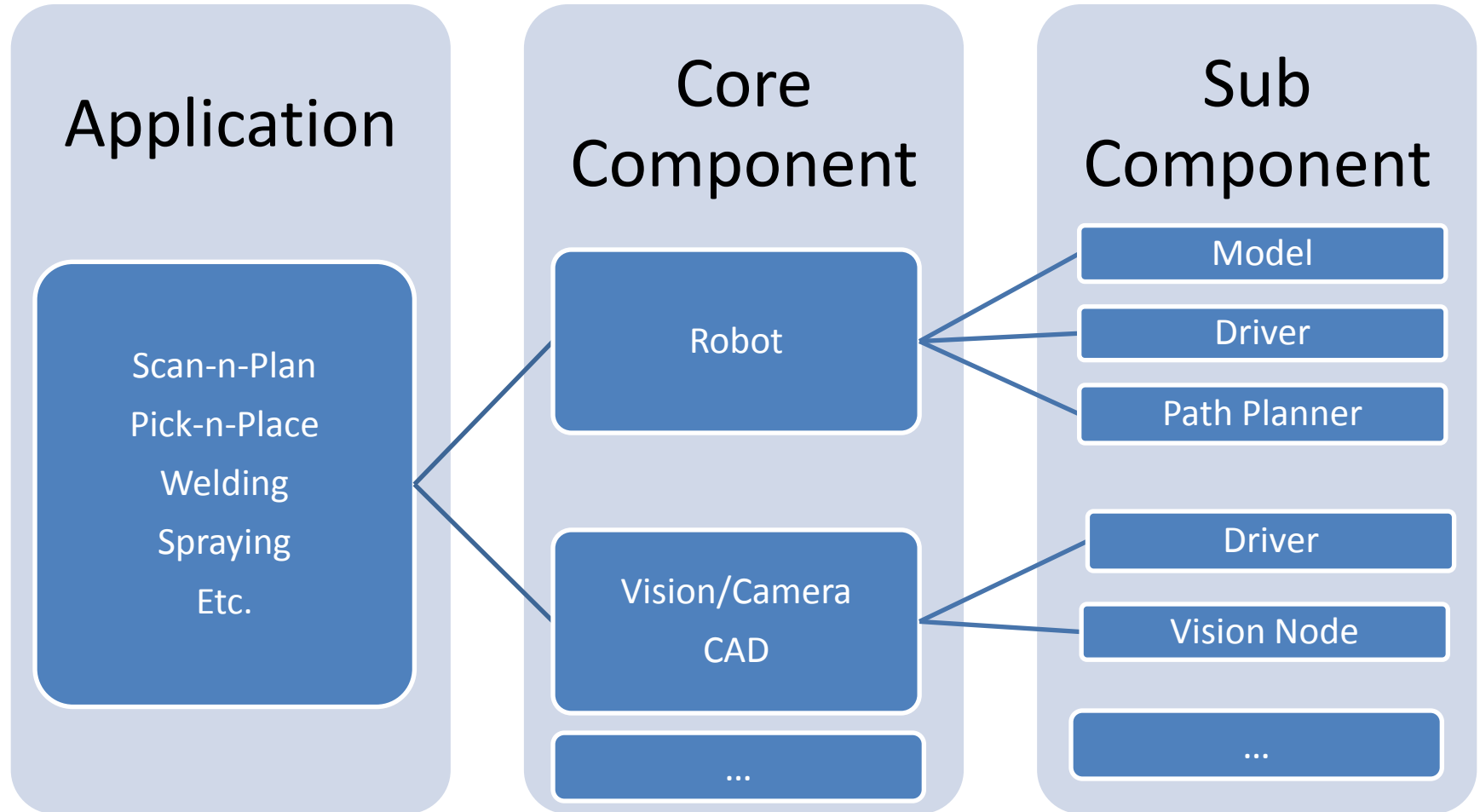
[https://github.com/ros-industrial/industrial_training/wiki/ROS-Industrial-\(Kinetic\)-Training-Exercises](https://github.com/ros-industrial/industrial_training/wiki/ROS-Industrial-(Kinetic)-Training-Exercises)

https://github.com/ros-industrial/industrial_training





Generic App. Architecture

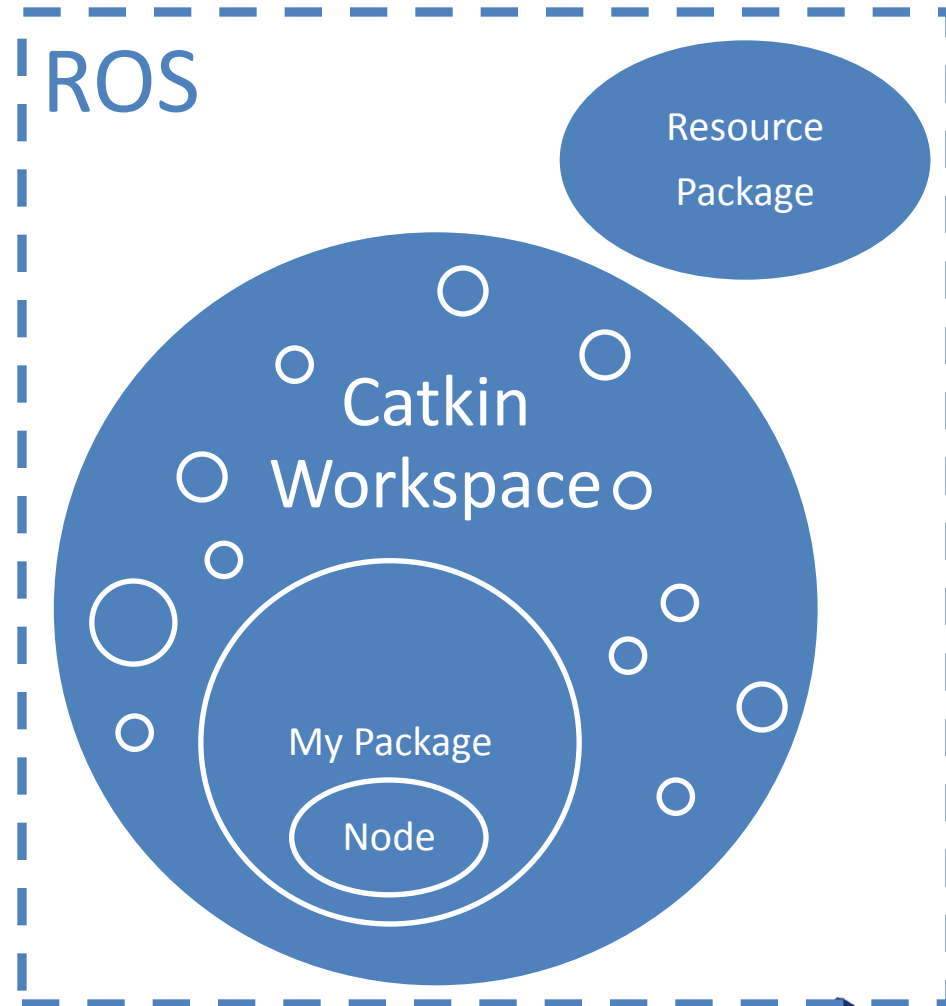




Day 1 Progression



- ☐ Install ROS
- ☐ Create Workspace
- ☐ Add “resources”
- ☐ Create Package
- ☐ Create Node
 - ☐ Basic ROS Node
 - ☐ Interact with other nodes
 - ☐ Messages
 - ☐ Services
- ☐ Run Node
 - ☐ rosrn
 - ☐ roslaunch

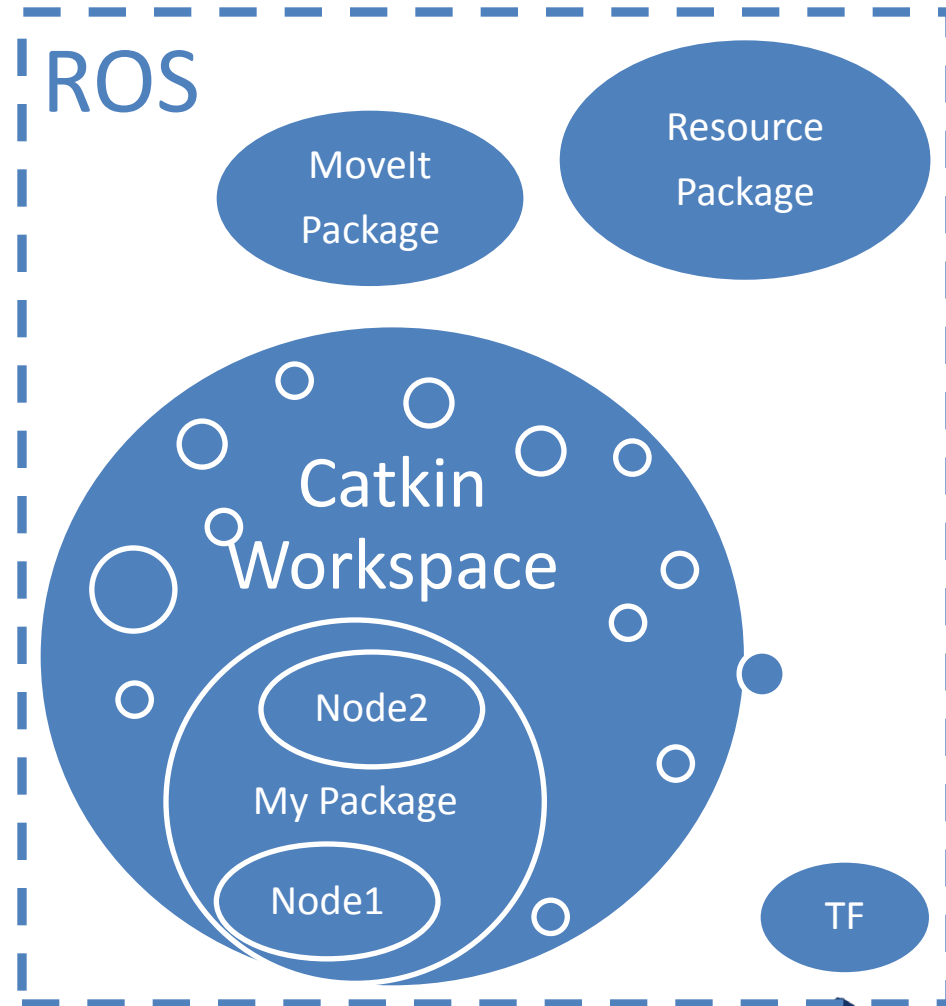




Day 2 Progression



- ☐ Build on Day 1 nodes
- ☐ Use TF
- ☐ Create Robot Model
 - ☐ Basic, URDF
 - ☐ Advanced, xacro
- ☐ Integrate Robot Model
 - ☐ MoveIt
- ☐ Integrate Path Planner
 - ☐ Descartes
- ☐ Dabble in Perception





Day 3: Scan-N-Plan App

