“...to support the development, distribution, and adoption of open source software for use in robotics research, education, and product development.”

http://osrfoundation.org
"please fetch the stapler from my office"

Integrative AI = lots of integration work

How can we reduce the pain?
bubbles = POSIX processes. no pre-defined structure.
start / stop / restart / crash / debug independently
arrows = peer-to-peer message streams
replace any component with your own!
open-source is a starting point for rapid-prototyping
ROS Tools

- motion planning
- vision
- navigation
- sensor fusion
- GUIs
- speech
- plotting
- mapping
- task planning
- simulation
- real-time visualization
- browser plugins
- logging / playback
- embedded bridge
- android bridge
- knowledge base
- hardware drivers
- task planning
ROS Tools: Hardware Drivers

- cameras
- depth cameras
- laser scanners
- robots
- audio
- inertial units
- GPS
- joysticks
- etc...
ROS Tools: 2D Navigation

- localization
- path planning
- 3D obstacle avoidance
- mapping (SLAM)
ROS Tools: Motion Planning

- kinematic modeling
- integrated sensing
- constraint generation
- trajectory smoothing
- trajectory following
- GUI plugins

http://moveit.ros.org

Morgan Quigley: Open Source Robotics
ROS Tools: Visualization

- Qt- and plugin-based
- Plot common datatypes
- Live 3D visualizations
ROS Tools: Simulation

- Gazebo: 3D dynamic
- Stage: 2D navigation, static
- Many more talk to ROS
- Everything downstream can't tell the difference
Showcase: DARPA Virtual Robotics Challenge