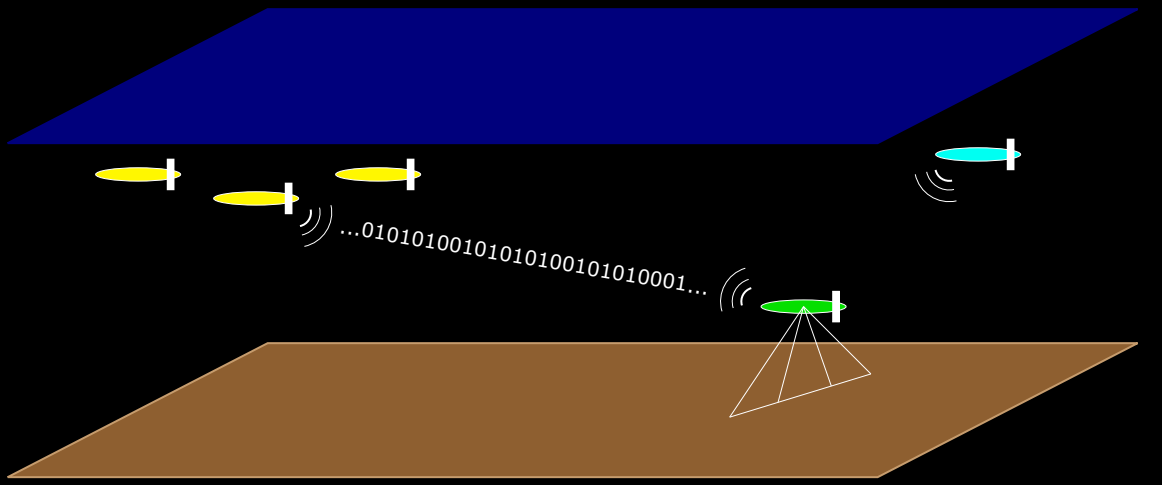
Goby3 Course

Day 3: Autonomy



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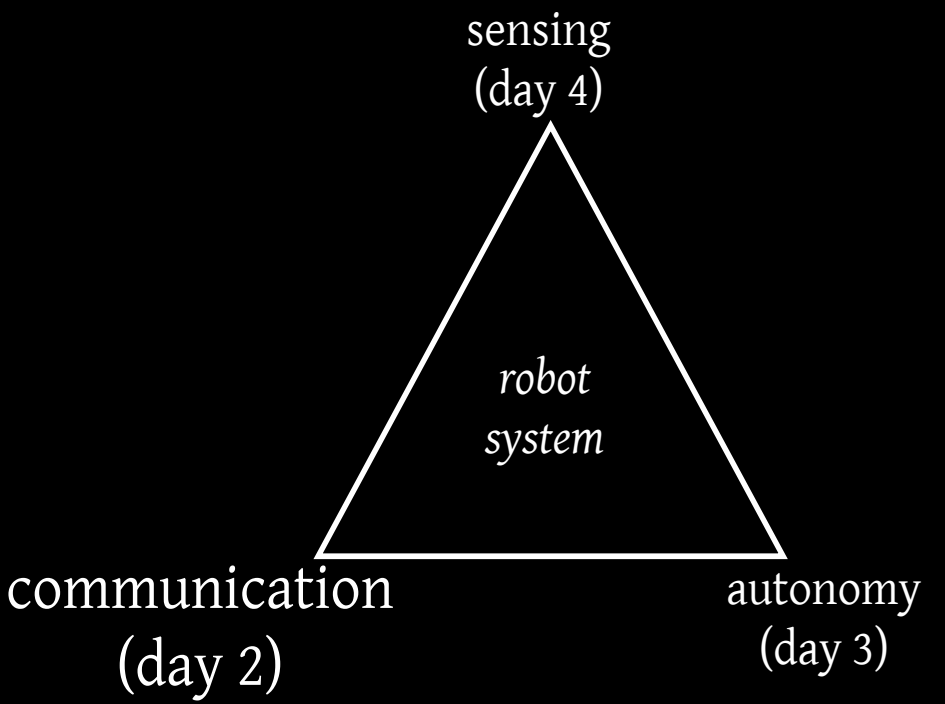
aquatic software

Robots (revisited!)

In many systems, this triad represents tradeoffs:

- More communications = less need for autonomy (UAVs)
- Better autonomy = better data from cheap sensors (Adaptive sampling)
- Better sensors = less need for outside data (Manned subs)



“Frontseat” - “backseat” abstraction

Useful abstraction:

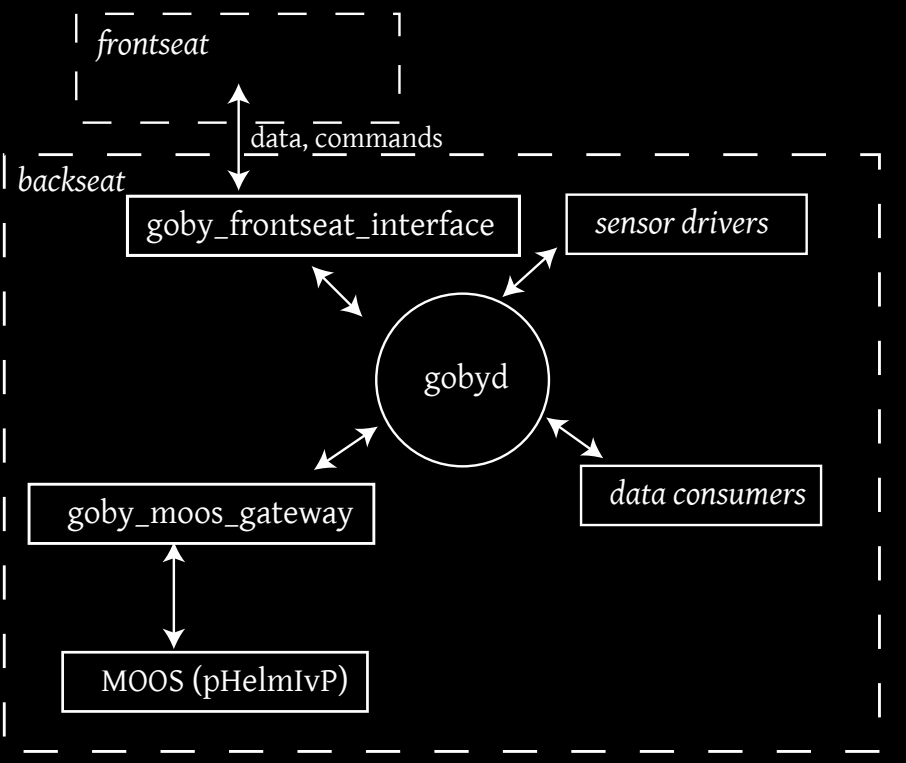
- AUV / USV manufacturer computer = “frontseat”
- Goby/MOOS-IvP/etc. payload computer = “backseat”

Allows for autonomy software to be deployed on a wide variety of different vehicles with different manufacturers.

What is a "frontseat interface"?

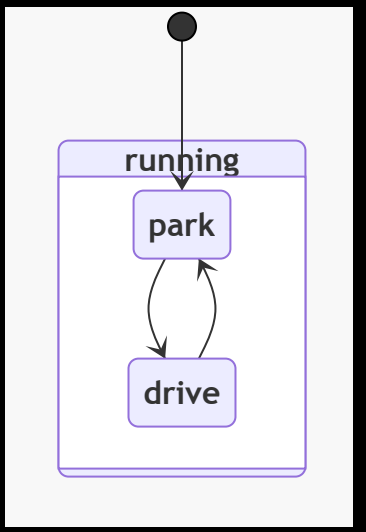
The frontseat interface has several main functions:

- *Current State*: Maintain knowledge of operational state of both frontseat and backseat.
- *Command*: Interface and translate desired setpoint commands to frontseat (e.g. desired heading, speed, depth)
- *Receive data*: from sensors residing on frontseat, and navigation estimate
- *Send data*: from sensors residing on backseat to frontseat.

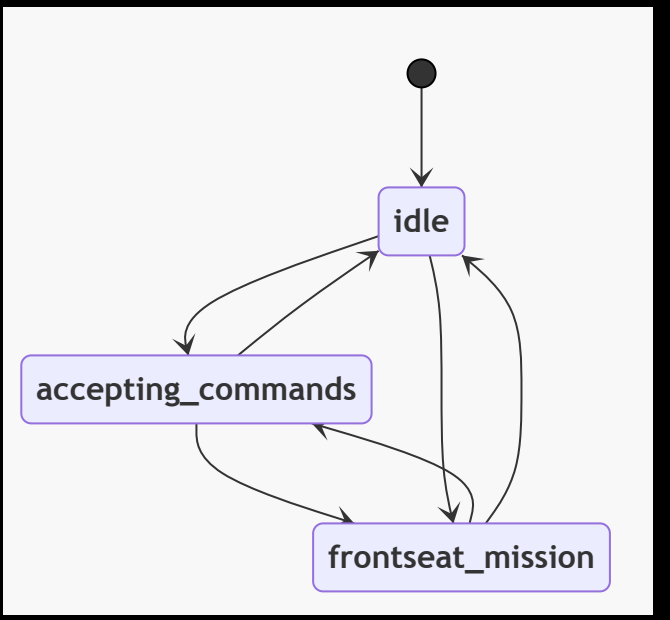


Backseat (Helm) / Frontseat State

Helm



FrontSeat

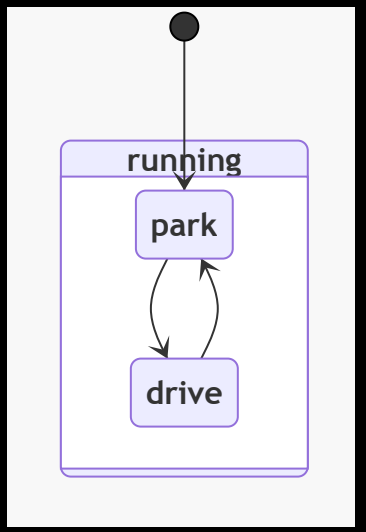


goby_frontseat_interface's state is governed by:

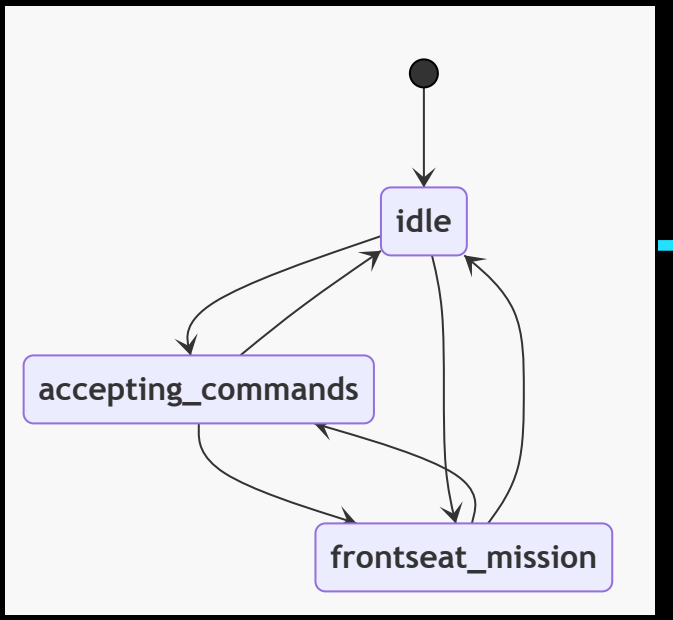
- The state of the IvP Helm (left)
- The state of the Frontseat (right)

goby_frontseat_interface state

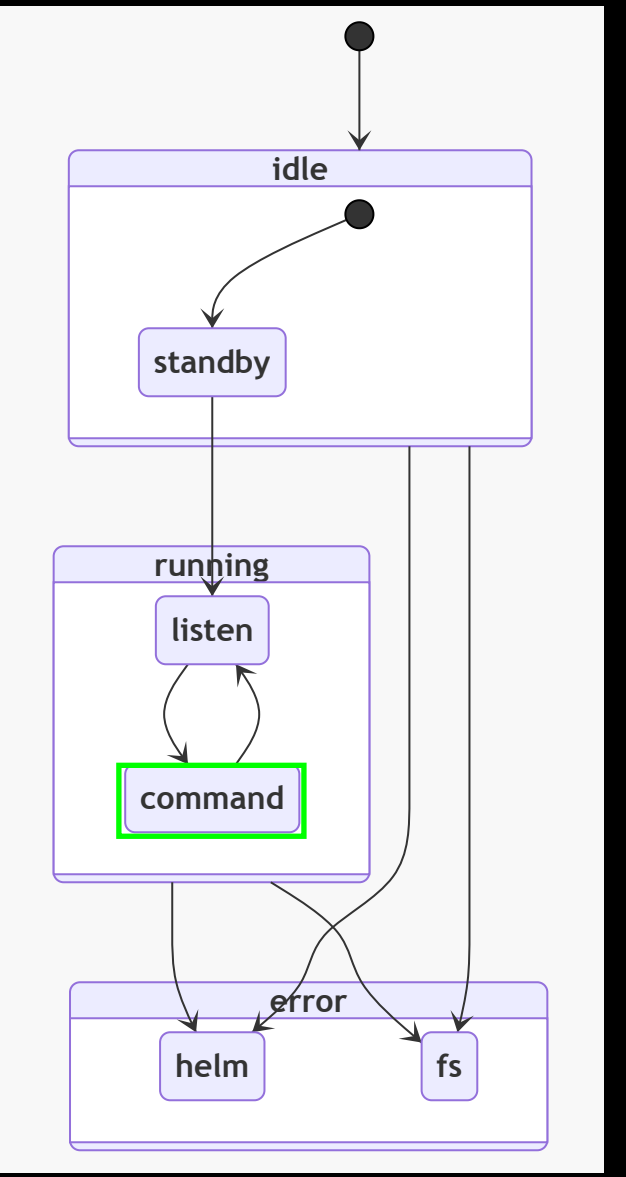
Helm



FrontSeat



goby_frontseat_interface



Start --(Configuration Read)--> Standby

Standby --(FS: Providing Data)--> Listen

Listen --(FS: Accepting Commands & Helm: Drive)--> Command

Command --((FS: Frontseat Mission || FS: Idle) & Helm: Drive)--> Listen

goby_frontseat_interface

Goby pub/sub visualization

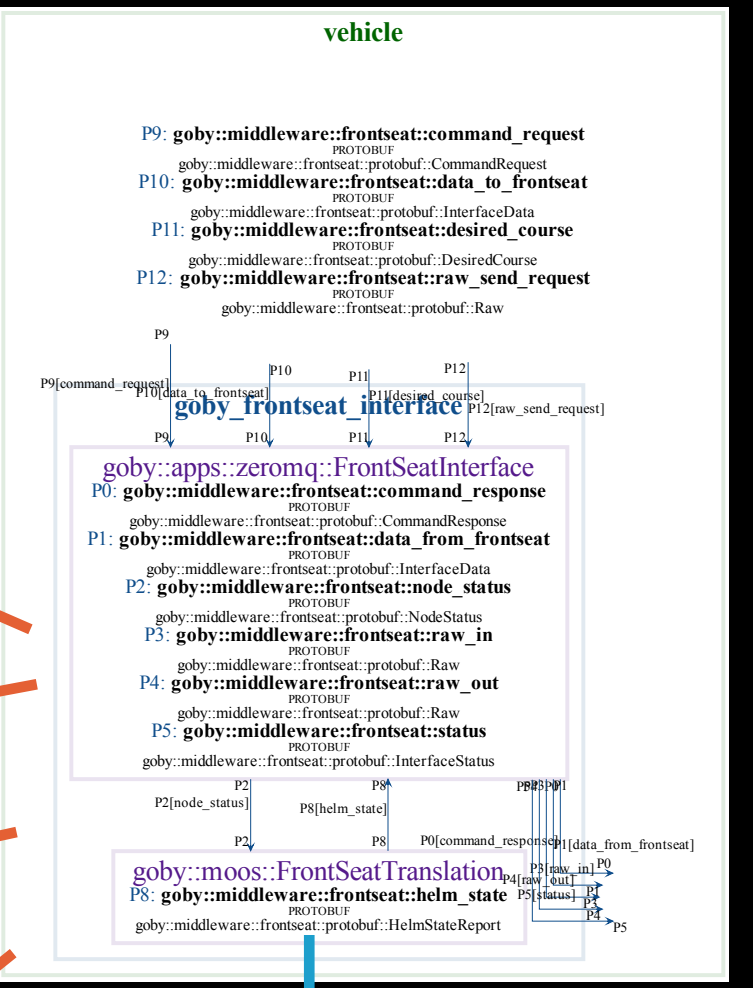
- command_request (e.g. desired setpoints)
- node_status (vehicle navigation)
- status: system states
- New vehicles are C++ .so plugin

plugin: basic simulator

plugin: Bluefin

plugin: Waveglider (SV2)

plugin: Iver3



Hands-on

Let's take a look at this now in the Trail example.

(Switch to VS Code).