

# AI

This page is **stale** and needs to be reviewed. It may be deleted or radically changed in the near future.

## Overview

Current AI uses SMACH package that is in ROS. SMACH is a task-level architecture for rapidly creating complex robot behavior. At its core, SMACH is a ROS-independent Python library to build hierarchical state machines.

Advantages of SMACH are:

- Ordered List Item rapid development, ability to create complex state machines;
- ability to quickly change state machines without big code changes
- explicitly define outcomes of every state thus covering most or all possible situations.

## Current AI

Our current AI was re-written using SMACH. There are several utility files such as:

- gate\_util.py - all states that are used by gate AI, they are generic.
- util.py - contains utility functions for vision to filter labels, get N most probably, normalize coordinates from vision, or wrap yaw. **\*\*Note that vision will be changed in future, some of the function will no longer be useful.\*\***
- basic\_states.py - contains all of the states for roulette and dice AI.
- control\_wrapper.py - wrapper made to ease communication with control system, making it easy to send basic commands such as dive, yaw, pitch, roll, move forward.
- start\_switch.py - every high-level state machine **\*\*must\*\*** have start\_switch as their first state. It is a state that waits for ros message to be sent over topic /start\_switch to be true at least 3 times.
- blind\_movement.py - contains move\_forward state that moves forward with //x// speed for //y// number of time.
- SubscribeState.py - a state that was made which accept also topic to which you want to subscribe. It is also modified to pass over any input/output keys. **\*\*In future this file will also contain SynchronousSubscribeState that subscribes to two topics and moves once it has two\*\***

There is a useful tool to see state machine and transitions of it called smach\_viewer. To run it run `<code bash>`

```
roslaunch smach_viewer smach_viewer.py </code>
```

From:

<http://robosub-vm.eecs.wsu.edu/wiki/> - **Palouse RoboSub Technical Documentation**

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Last update: **2018/02/23 17:57**