

# 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:

1. Ordered List Itemrapid development, ability to create complex state machines;
2. ability to quickly change state machines without big code changes
3. 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:

1. gate\_util.py - all states that are used by gate AI, they are generic.
2. 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.**
3. basic\_states.py - contains all of the states for roulette and dice AI.
4. 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.
5. 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.
6. blind\_movement.py - contains move\_forward state that moves forward with x speed for y number of time.
7. 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

```
roslaunch smach_viewer smach_viewer.py
```

From:

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

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