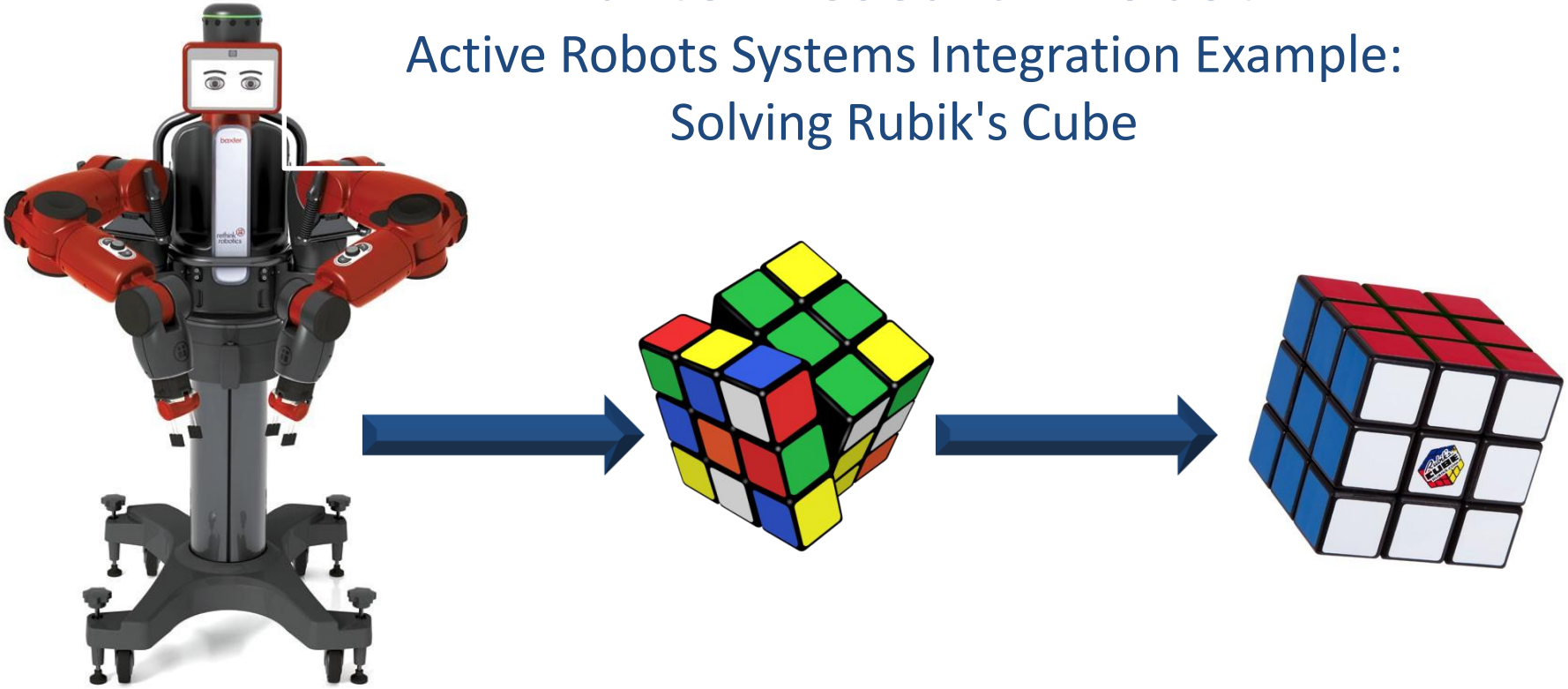
Baxter Research Robot

Active Robots Systems Integration Example: Solving Rubik's Cube



Baxter Solving the Rubik's Cube

Code: Python

ACTIVE ROBOTS
www.active-robots.com

DETECT
Open CV

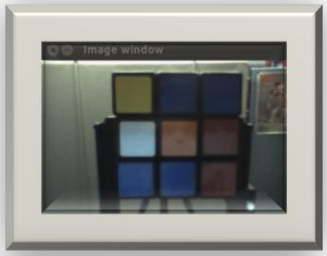
VERIFY
Algorithms Developed In-House

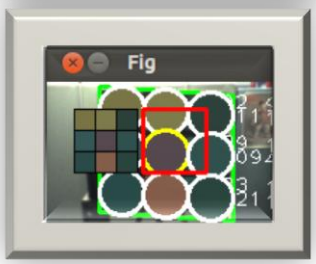
SOLVE
2-stage Kociemba Algorithm

MANIPULATE
RSDK + MoveIt Inverse Kinematics

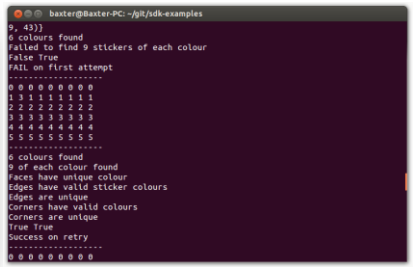
COMPLETION

Using edge detection to look for defined areas of colour within black borders. Detection of 9 areas of uniform colour. Colours as RGB tuples.





Take colour tuples and match them in vector space. Verify that the result is a valid mapping for a Rubik's Cube



A search based algorithm for solving any mapping of the Rubik's Cube. 2-stage Kociemba reduces the search space using group theory.

Baxter arm movement using MoveIt for OMPL based IK, interfaced using the MoveIt Commander Python wrapper. Additional direct joint control /feedback directly using RSDK API.

System Integration Example Developed by Active Robots