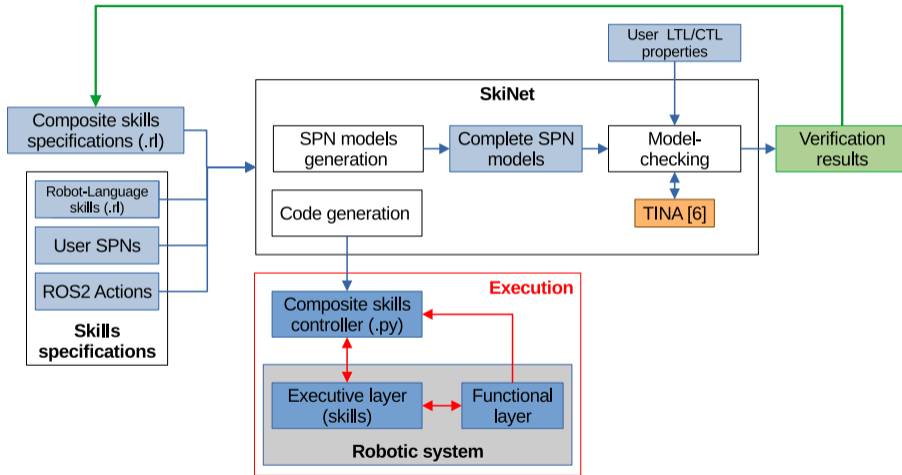


# **A Formal Framework for the Specification, Verification and Validation of Robotic Skills Composition for Autonomous Behaviors**

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# Framework Overview



## Inspecting an underground facility using autonomous robots

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**Framework Demonstration** - the framework is used to specify an autonomous mission as a composition of elementary skills.

- **Robots:**

- **Spot** (Boston Dynamics): basic skills (motor power skills and stand/sit) and go-to skills
- **Jaco** (Kinova): manipulator movement skills, switch between folded/unfolded positions
- **Infrared camera**: detect heatpoints

- **Mission objectives and constraints:**

- Observe pipes heat signature and pressure data
- If heatpoints are detected, teleoperation will be used for closer inspection
- Wi-fi signal with human operator is very poor, system needs to be completely autonomous
- For safety, manipulator arm must be folded when not in use