B&P Project 23-3: Robot Operating System 2 Tools for Research and Development (ROSTRD)

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Start TRL: 4   **End TRL:** 6

Primary Taxonomy: TX04.6.3 Robot Software

Secondary Taxonomy: TX11.1.7 Frameworks, Languages, Tools, and Standards

Project Description: The purpose of this project is to develop a Robot Operating System 2 (ROS2) compatible software library that dramatically simplifies development of robotic and autonomous systems in a research and development (R&D) environment. It will allow faster prototyping and testing of autonomous systems and robotics. The project leverages our expertise using the ROS2 framework to develop and publish a library of common utilities and functions that dramatically increase the speed of development within ROS2. These tools will allow engineers and scientists to focus on their research, and less on the overhead of software development needs for robotics. It will allow more rapid testing and prototyping cycles for robotic systems, including surface excavation and construction demonstrations while reducing development time and associated cost. The tools to be implemented are the result of years of experience and use of ROS2 in a research environment, and a deep understanding of where the workflow could be improved and streamlined to support rapid prototyping.

Closeout Summary: Robot Operating System 2 Tools for R&D (ROSTRD) project successfully completed the development of the proposed software library and accomplished all of its objectives. The project raised the TRL of the proposed technology from 4 to 6. The software library, demonstration applications, supporting documentation and more are all hosted on our internal GitLab server: https://swampworks.ksc.nasa.gov/rostrd.

The goal of this project was to develop a software library that enabled faster, more robust, and more feature rich prototyping of robotics software and to reduce overhead that typically comes with robotics software development. The primary way ROSTRD does this, is by packaging the large amount of tedious overhead code required for user interactions with software into a more streamlined library. The use of the ROSTRD library enables a streamlined visual drag and drop style of creating functional and robust GUIs for robotics control.