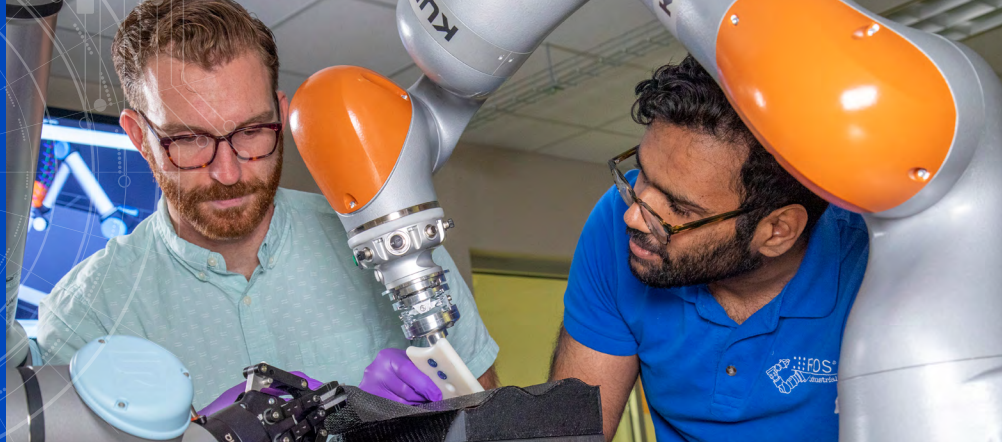
SwRI®

SOUTHWEST RESEARCH INSTITUTE



SWORD™ CAD-Based Robotic Motion Controller

Revolutionize robotics capabilities for your business using Southwest Research Institute's easy-to-use CAD-based toolkit for robotic motion planning.

SwRI Workbench for Offline Robotics Development™ (SWORD™) is a plugin for FreeCAD that integrates robotics capabilities into a familiar, cross-platform environment. The easy-to-use graphical interface harnesses powerful motion-planning libraries for simplified, code-free robotics development.

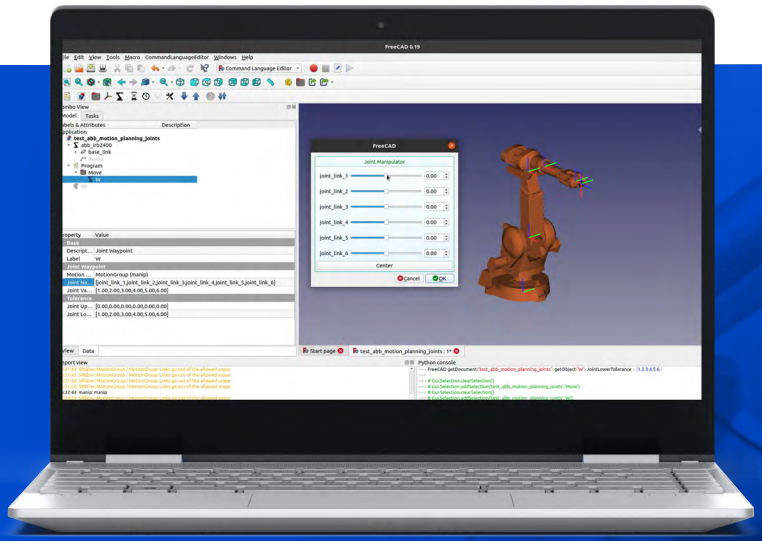
SWORD is a streamlined tool for both robotics engineers and software developers. It supports Robot Operating System (ROS) applications or can be used independently of ROS.

SWORD

- ✓ Embedded in a CAD environment
- ✓ Advanced robotics capabilities
- ✓ Vendor and robot agnostic
- ✓ Scriptable

Capabilities

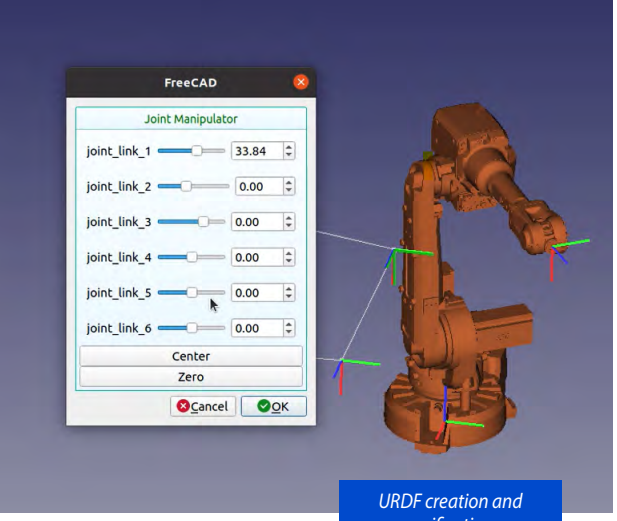
- Environment Modeling
  - Create or import a CAD model of your robot, including fixtures and end-of-arm-tooling
  - Manipulate and control your robot model using joint sliders
  - Simulate movement with TCP Dragger using multiple IK solvers
- Robot Manipulation and Motion Planning
  - Generate motion plan using Tesseract-supported path planners
  - Create custom planning pipelines for application-specific behavior
  - Predict and avoid movement collision
- Command Language
  - Define robot motion using Cartesian or joint waypoints
  - Specify different move segment types (joint/Cartesian) and motion groups
  - Insert supplementary commands (I/O, delays, etc.)



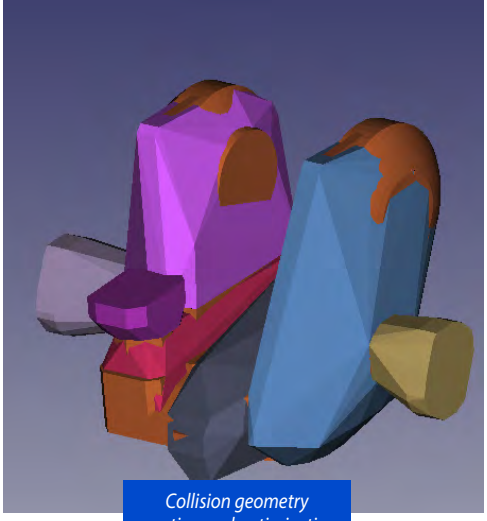
SWORD

CAD-based advanced robotic application modeling and development environment

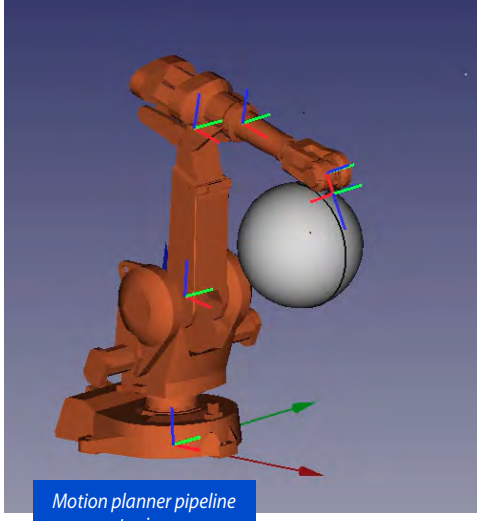
Advanced science. Applied technology.



URDF creation and verification



Collision geometry creation and optimization



Motion planner pipeline tuning

Modules

- Environment Creation
  - Scene modeling
  - Convex hull creation
  - Convex decomposition
  - Allowed collision matrix generation
  - Collision detection/visualization
- Motion Configuration
  - Motion group definition
  - IK solver configuration
  - Cartesian TCP dragger
- Motion Planning
  - Waypoint generation
  - Motion planner configuration
  - Motion planner pipeline configuration
  - Trajectory visualization/introspection
- Export Artifacts
  - URDF
  - SRDF
  - Tesseract
  - Robot native program

Training Available!

SwRI developers offer an in-person SWORD bootcamp, providing a unique opportunity to learn from the creators of SWORD to maximize your skills. Workshops will include focused topics for functional area interests.

Engineer bootcamp available

ROS developer bootcamp available

SWORD

SwRI WORKBENCH FOR OFFLINE ROBOTICS DEVELOPMENT

A Product of SwRI

We welcome your inquiries. For more information, please contact:

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Designed & printed by SwRI MPS 10-0124 JCN 271342 tp