



# Head to Head: Movelt Pro vs NVIDIA ISAAC

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➤ This document compares the Movelt Pro Robotics Development Platform and the Isaac Manipulator libraries and reference workflows.

➤ We at PickNik believe that Movelt Pro's capabilities are a much larger superset of what Isaac provides, and Movelt Pro can integrate all of Isaac's libraries through our easy to extend Behavior plugins.

## Why choose Movelt Pro?



### Hardware agnostic

Runs on Intel, AMD, or NVIDIA; compatible with any ROS 2 robot.



### Developer experience

Extensible Behavior Tree runtime with pre-built skills for quick development



### Built-in ML and classical planning

Combines transformers with fast, safe, deterministic algorithms.



### Support and implementation

PickNik is focused on speeding up your companies' time to market.



### Production-ready

With MISRA software compliance, extensive unit testing, and many deployments.



### Optionally integrates Isaac algorithms

Take advantage of GPU acceleration without being locked in.

## Overview

Feature	Movelt Pro	Isaac Manipulator
Category	Full-stack robotics manipulation-specialized developer platform	Example code for running robotics on CUDA
Primary Strengths	<ul style="list-style-type: none"> <li>Real-time deterministic planning</li> <li>ML model deployment</li> <li>High fidelity physics simulation</li> <li>Debug tools</li> <li>ROS tooling</li> <li>Chipset agnostic</li> </ul>	<ul style="list-style-type: none"> <li>High-fidelity graphics</li> <li>CUDA-accelerated algorithms</li> </ul>
Typical Morphologies	<ul style="list-style-type: none"> <li>Stationary arms: single arm, multi-arm system</li> <li>Mobile bases: mobile manipulators, arms on linear rails</li> <li>Aerial platforms: arms mounted on drones</li> </ul>	<ul style="list-style-type: none"> <li>AMRs</li> <li>Humanoids</li> <li>Limited robot arms</li> </ul>

## Supported platforms

Feature	MoveIt Pro	Isaac Manipulator
Computer platform	✓ Jetson, all other compute devices	⚠ NVIDIA Devices only
CPU	✓ Intel, ARM, AMD, RISC-V	⚠ Only on x86_64 or Jetson with CUDA GPU
GPU	✓ Any GPU (including NVIDIA)	✗ Requires Ampere NVIDIA GPU Architecture or newer
Operating system	✓ Ubuntu Linux	✓ Ubuntu Linux
Runs on a standard laptop	✓ No high end NVIDIA laptop required	✗ High end NVIDIA required

## Robot hardware support

Feature	MoveIt Pro	Isaac Manipulator
Robot hardware agnosticism	✓ Any robot with ROS 2 driver, many work out of the box.	⚠ Arm Support limited through MoveIt 2 OSS
Mobile base support	✓ Built-in Nav2 integration, whole-body planning	⚠ Minimal support, not a focus
Multi-arm support	✓ Out of the box multi-arm coordination and motion planning	✗ Requires Ampere NVIDIA GPU Architecture or newer
Tool/gripper flexibility	✓ No high end NVIDIA laptop required	✗ High end NVIDIA required

## Motion planning & control

Capability	MoveIt Pro	Isaac Manipulator
Free-space planners	✓ Pro-RRT is 4x faster than MoveIt 2	✓ CuMotion
Cartesian planning	✓ 30x faster vs MoveIt 2	✗ Not available
Inverse kinematics	✓ 35x faster vs KDL/TracIK	✗ Not available
Force-aware control	✓ Built-in admittance & guarded motion	✗ Not available
Visual servoing	✓ With behavior-based execution	✗ Not available

## Developer experience

Feature	Movelt Pro	Isaac Manipulator
Example applications	✓ Examples: 6 worlds & 20 applications	✗ None
Behavior trees	✓ Native editor and runtime	✗ Not supported
CI regression testing	✓ Continuous testing of robot applications	✗ Not supported
Debugging tools	✓ Integrated introspection, breakpoints	✗ Not supported
Data visualization	✓ Trajectory introspection, Point Clouds	✗ Not supported
Teleoperation	✓ Comprehensive human in the loop	✗ Not supported
Real-time tuning	✓ Parameter tuning, force adjustment UI	✗ Not supported
Modular architecture	✓ C++/Python Behavior Tree plugins	⚠ Minimal support

## Machine learning

Capability	Movelt Pro	Isaac Manipulator
Pre-trained segmentation	✓ Segment Anything, CLIPSeg	✓ SyntheticaDETR, YOLOv8
Grasp generation	✓ Learning to Grasp (L2G)	✓ GraspPoseNet
End-to-end manipulation	✓ Diffusion Policy	⚠ Not implemented
ML safeguards	✓ Collision-checking	✗ Not supported
Physics simulation	✓ High fidelity physics (MuJoCo)	✓ Isaac Sim (physX)
Model training	✓ Synthetic data sim pipeline	✓ Omniverse Replicator
Human data collection	✓ Collision and force-aware Teleoperation	✗ Not supported
Runtime deployment	✓ ONNX (TensorRT, CUDA, CPU)	✓ TensorRT, CUDA

## Production readiness

Metric	Movelt Pro	Isaac Manipulator
MISRA compliance	✓ Yes (automotive-grade code quality)	✗ Not supported
Unit test coverage	✓ 80%+	⚠ Not disclosed
Deployments	✓ 10 years of commercial experience	⚠ Research and development

## ★ Summary

### Movelt Pro

Robotics developer platform by PickNik

Application need:

- ✓ Robot-agnostic manipulation for any hardware
- ✓ Deterministic, production-grade motion planning
- ✓ Multi-arm, mobile manipulation, hybrid AI planning

### NVIDIA Omniverse Replicator

Can be used alongside Movelt Pro

Application need:

- ✓ Synthetic data generation for ML models

### About PickNik Robotics

PickNik Robotics is a leading developer of robotic arm applications, providing cutting-edge software and services to automate complex tasks. Our flagship product, Movelt Pro, is designed to help organizations achieve unprecedented efficiency and precision in their robotic operations. Founded in Boulder, Colorado, PickNik Robotics is committed to pushing the boundaries of what is possible in the field of robotics.

Get in touch

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We help companies deploy AI to robot arms quickly.