v-rep

virtual robot experimentation platform

Create.
Compose.
Simulate.
Any Robot.

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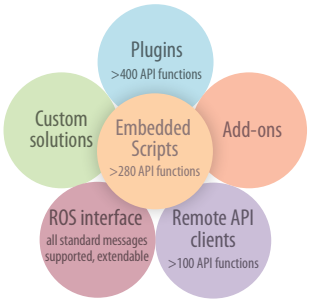
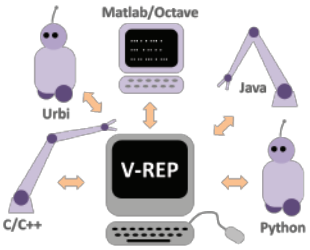
Main Features:

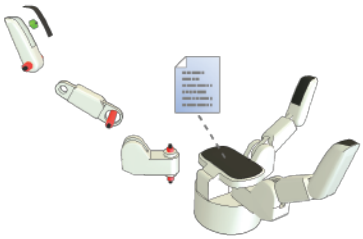
Crosss-platform & portable content: V-REP is cross-platform, and allows the creation of portable, scalable and easy maintainable or modifiable content: a single portable file can contain a fully functional model or scene, including control code



Six programming approaches: Simulator and simulations are fully customizable, with six programming approaches that are mutually compatible and that can even work hand-in-hand

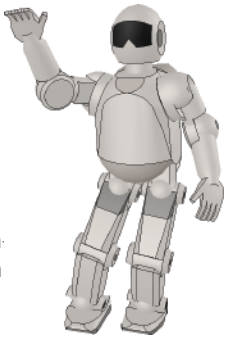


Remote API: More than 100 embeddable V-REP functions: control a simulation or the simulator itself remotely (e.g. from a real robot or another PC). Easy to use, supports sync. or async. operation, is optimized for heavy data transfer and minimizes communication lag. Six languages are supported

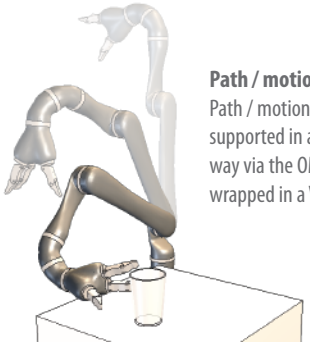


Building block concept: Anything - from sensors or actuators, to whole robotic systems - can be built within V-REP by combining basic objects and linking various functionality via embedded scripts. Each scene object can have its own embedded script

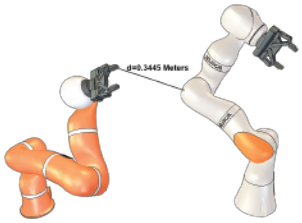
Forward/inverse kinematics: Full forward/inverse kinematics calculations module for any type of mechanism (branched, closed, redundant, containing nested loops, etc.). Can be embedded



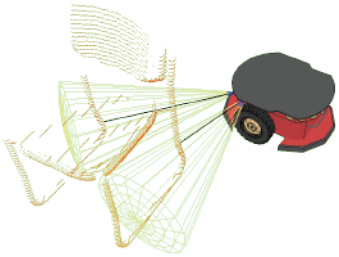
Dynamics/Physics: Fast and customizable dynamics calculations to simulate real-world physics and object interactions (collision response, grasping, etc.). Four engines are supported: Bullet, ODE, Newton and Vortex



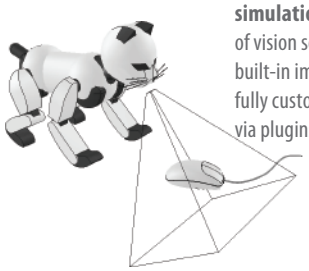
Path / motion planning: Path / motion planning is supported in a very flexible way via the OMPL library wrapped in a V-REP plugin



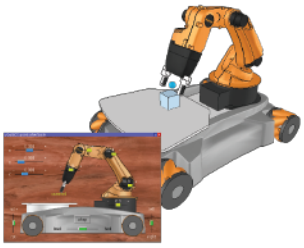
Collision detection and distance calculation: Fast interference checking and minimum distance calculation between any mesh, octree or point cloud



Proximity sensor simulation: Powerful proximity sensor simulation, fully customizable. Performs an exact minimum distance calculation within a custom detection volume (more realistic than discrete detection rays). Operates on meshes, octrees and point clouds

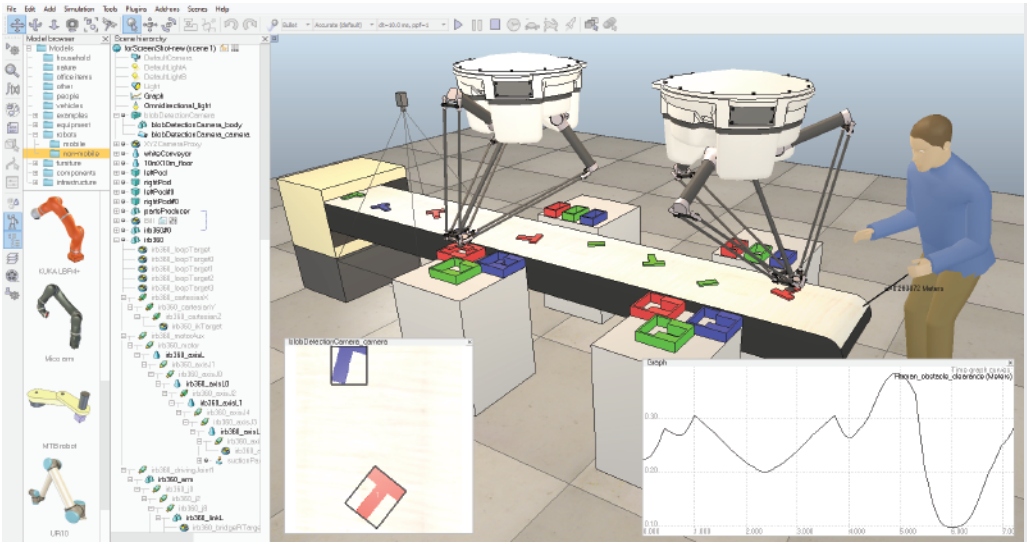


Vision sensor simulation: Simulation of vision sensors with built-in image processing, fully customizable (e.g. via plugins)



Custom user interfaces: Unlimited number of fully customizable user interface elements. Windows style or OpenGL style.

Many more features: e.g. headless mode, data recording and visualization, mesh edit modes, RRS-1 specification support, convex decomposition functions, Reflexxes Motion Library, support for haptic devices, video recorder, simulation of paint or welding seams, full source code available, etc.



Demonstration videos, free non-limited educational & commercial evaluation version at:

www.coppeliarobotics.com

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Displayed CAD models are courtesy of Lyall Randell, Hibot, Kinova Robotics, Barrett Technology, KUKA and ABB. There is however no link between V-REP and ABB.