

MotoSight 3D Spatial Vision



MotoSight 3D Spatial Vision delivers scalable 3D vision guidance at 2D prices for Motoman® robots. Featuring Universal Robotics' Spatial Vision® Robotics software, MotoSight 3D Spatial Vision delivers market-leading price/performance vision guidance. It provides stereo vision using just the right mix of standard webcams or GigE cameras with 3D world-class pattern matching to determine true 3D for six degrees of position and pose information. When combined with PC hardware, you have a complete vision guidance system integrated with your robotic application. Adding tailored high-speed servoing through the Motoman robot controller completes your part picking, box moving or automated kitting job.

HIGHLIGHTS

Key Applications

- Random part picking
- Box moving
- Automated kitting

Features

- Easily acquire images from USB webcams and GigE cameras.
- Align loosely-placed webcams without specialized hardware.
- Calibrate camera-to-camera and camera-to-robot (hand-eye).
- Object tracking provided in six degrees of freedom (X, Y, Z, Rx, Ry, Rz).
- Match parts based on 3D shape, even with partially occluded objects under varying lighting conditions.
- Real-time vision guidance.
- Track stationary or moving parts.
- Use standard AutoCAD DXF file for parts of interest.
- Estimate 3D accuracy on-the-fly using vision processing tools.

Calibration

- Calibration of internal and external camera parameters from multiple images; correction of lens distortions; transformation into world coordinates; rectification of images; and hand-eye calibration.
- 3D calibration for vision guidance is automatic for Motoman robots using DX100 or NX100 controllers with MotoCom SDK using a Halcon pattern. Initial calibration time requires selection of 15 points within the workcell space of the robot for creation of calibration job.
- Alignment wizard walks user through simple process of calibrating the cameras and robot, and loading standard CAD files of parts for tracking.
- Calibration files can interface to C, C++ or MATLAB robotic real-time control programs.

Performance

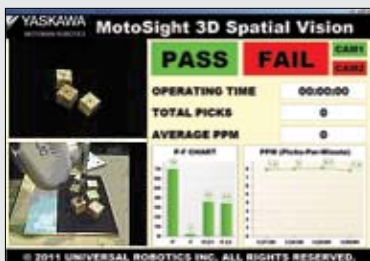
- 6 - 10 parts or boxes per minute for complete system performance.
- 0.10 sub-pixel software accuracy...scalability for just the right accuracy.
- Accuracy is achieved through advanced vision processing of raw images for image rectification, Laplacian of Gaussian and dense stereopsis for full-frame depth maps.

Speed (ms)

- Initial find of three identical objects:
6 DOF in ROI @ 70% Full Frame = 1,420 ms
6 DOF in ROI @ 50% Full Frame = 700 ms
- Initial find of one object:
6 DOF in ROI @ 70% Full Frame = 700 ms



PART PICKING



RESULTS SCREEN

TOP REASONS TO BUY!

- True 3D at 2D prices
- Scalable – choose cameras for the right precision
- Visual servoing in 3D for robot control

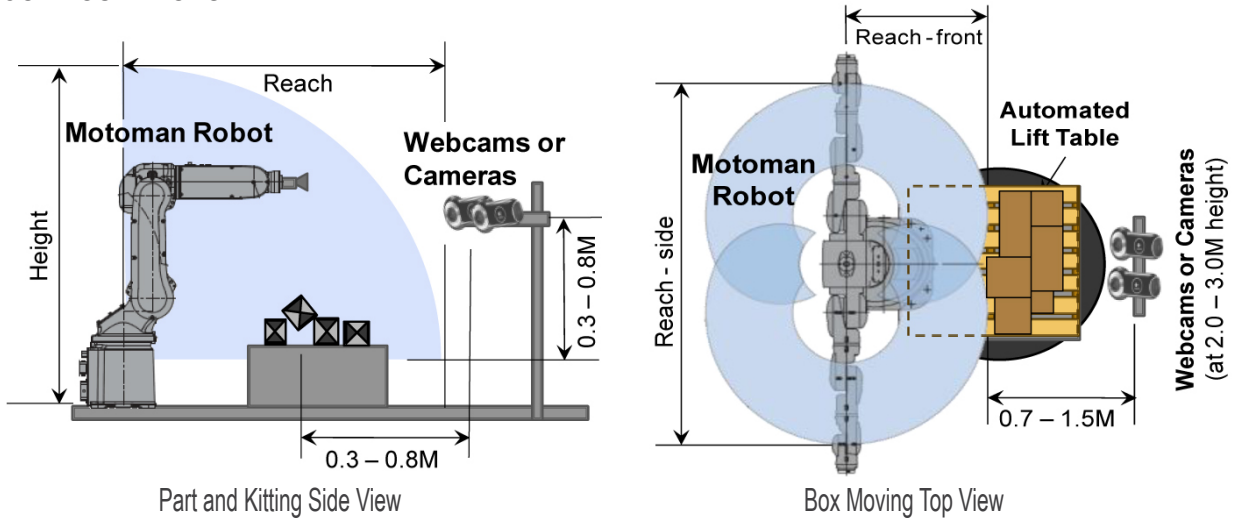
EASY-TO-USE...

1. Hook up your webcams
2. Verify image acquisition
3. Run the alignment wizard
4. Take 15 snapshots of a pattern in the robot workcell
5. Load a standard CAD file of your part
6. Run the software 'training' step

...YOU'RE READY TO GO!

MOTOSIGHT 3D SPATIAL VISION

TYPICAL CONFIGURATIONS

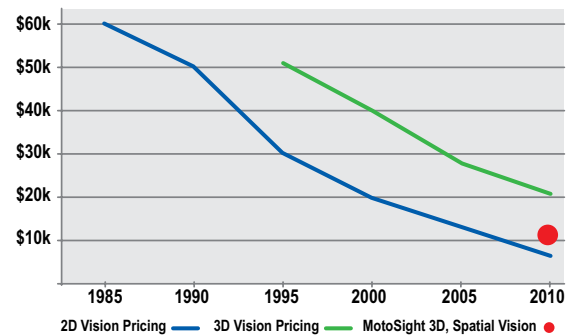


RECOMMENDED SYSTEM REQUIREMENTS		
Computer		Processor: Intel Core i5
		Memory: 4 GB
		Hard disk: 1.2 GB free
		Display: 1280 x 720 or higher resolution
		Operating System: Microsoft Windows® XP SP2 or Windows 7 (64-bit recommended for large-block memory addressing)
Communication Ports	USB	Two USB 2.0 ports via PC or USB 2.0 hub
	GigE	Two 1000 BASE-T Ethernet connections that support Jumbo frames (9,000 bytes Maximum Transmission Unit), such as Intel Pro/1000 GT
Cameras	USB 2.0	Matched pair of USB 2.0 webcams or cameras Spatial Vision is optimized with Logitech 9000 webcams (960x720 at 15 fps)
	GigE	Matched pair of GigE cameras. Optimized with Allied Vision Manta and Prosilica (GC, GE, GS) GigE cameras
		Choose combination (35 cameras with >10 lenses) of vision accuracy and speed required with focal lengths of 8, 12, 16 mm; resolutions from 1024 x 1024 at 59 fps to 2448 x 2050 at 15 fps

3D SYSTEM ACCURACY	
System	Distance to object from cameras
	Distance between pair of cameras
Software	Visual servoing accuracy
	MotoSight 3D Spatial Vision accuracy
Hardware	Camera effective focal length
	Camera resolution
	Robot mechanical precision

To achieve best accuracy for the selected software, adjust system geometry, use cameras with high focal length and resolution, and chose a precise robot.

3D Vision at 2D Prices



Licensing and Support

Activation and Term: MotoSight 3D Spatial Vision 2.0 is a perpetual individual license, with the right to use the software indefinitely. It is installed and activated on a single designated computer. It may be deactivated, moved and reactivated on another computer as needed. Access via the internet is required for initial registration and activation with Universal Robotics, Inc.

Software Support and Maintenance: The first six months of support service is included with a purchased product license. You can continue uninterrupted service in subsequent years by renewing your Universal Robotics subscription. Subscription provides you access to new features delivered in product releases, technical support via phone, email and web, and bug fixes.

MotoSight 3D Spatial Vision is patent protected.



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