



Project Outline

SiLA® Based Embedded Machine Vision Robotic Cell



Introduction

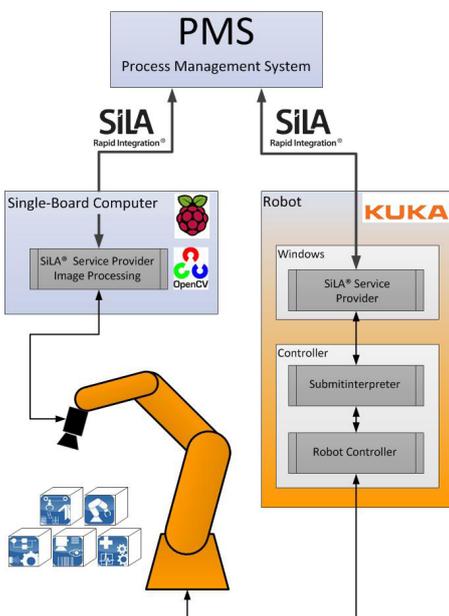
A robotic cell has been developed to demonstrate the competence of the ILT on fairs and promotional events, especially in the area of robotics, image processing and laboratory automation. This cell consists of two main components: a low-cost open-source image processing and a standard industrial articulated robot. These components are controlled by a PMS (process management system) through a SiLA® interface, which is an upcoming Standardization in Lab Automation. The demo cell is a good example for an implementation of this communication standard, because the used robotic system was not primarily developed for laboratory applications.

SiLA

Rapid Integration®

Application of the demo cell

The demo cell is skilled to put back together the pieces (dices) on which ILT pictograms are applied. The pieces located anywhere in the working range are detected by image processing, measured, sorted and corresponding information is sent to the PMS. The PMS then sends the appropriate commands to the articulated robot, which then puts the dices with the pictograms in correct order. Finally, the robot dissolves the correctly set up pictograms by tilting the shelf.



Communication – SiLA®

The SiLA® Standard has been applied for the communication between the different devices. On the image processing side, SiLA® was directly implemented into the device (certified equipment). On the robot side, a Core Service Provider was implemented as a SiLA® Interface Converter (supported equipment).

Image processing

The complete image processing is based on the open source software OpenCV and runs on a single board computer (Raspberry Pi), whereas the image is being taken by a simple pinhole camera. Through the use of these components a very cost-effective embedded image processing system can be achieved.