drag&bot

robot programming framework

Fraunhofer IPA

eXIST — Existenzgründungen aus der Wissenschaft

ROBOTICS AWARD

GRÜNDER WETTBEWERB — DIGITALE INNOVATIONEN

TechFounders

WHAT IS DRAG&BOT?

drag&bot is a software for simple, graphical setup and programming of robot applications.

Your advantages

- 5x faster programming of robots in comparison to state-of-the-art programming
- software is independent of robot manufacturers and brands
- +10 years of experience in programming innovative robot applications at Fraunhofer IPA
- 50% cost savings in contrast to turnkey solutions

- cost-efficient automation by flexible change of robot tasks
- no IT/robot skills or expensive training by robot manufacturers required
- production workers can now operate and program robots

HOW DOES DRAG&BOT WORK?

Builder: Create and customize programs

The drag&bot Builder allows to drag and drop predefined function blocks into applications. drag&bot contains all function blocks required for standard robot applications:

- move the robot
- open and close grippers
- set and read I/Os
- palletizing
- loops, conditions, parallel execution
- wait, cancel program, ...

The function blocks mentioned above can be easily combined into new function blocks, e.g. you can create a "pick part" function block out of a "move robot" and a "gripper close" block. Thus, it is possible to create or adapt robot applications without programming knowledge.
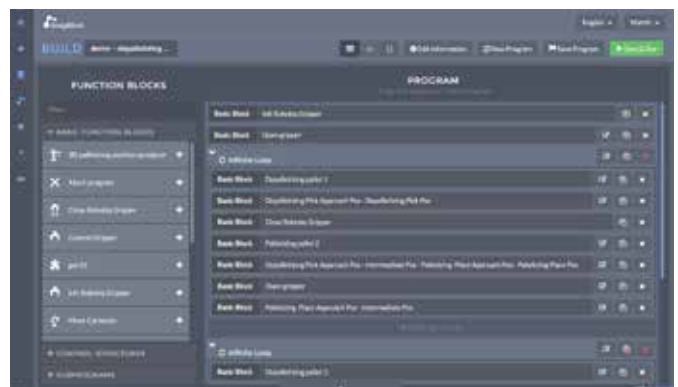
In the Builder, function blocks are combined to an application sequence via drag and drop

Wizards: Define parameters

Wizards are graphical helpers for setting input parameters of function blocks. The following Wizards are always part of drag&bot:

- move the robot and take over positions
- create robot trajectories from individual positions
- set finger position, closing force and closing speed of electric grippers
- define the grid of a magazine for removal/storage of parts
- many more Wizards are possible and easy to implement Contact us!

Wizard example: use the drag&bot teach panel to move the robot

Run-View: Execute applications

With one click, the user can switch from the Builder to the Run-View. In the Run-View, the created application can be tested immediately on a real robot. The movement speed can be adjusted continuously. Starting from slow speed for first tests up to maximum speed for production.

The user gets information about the current state while an application is running. If he wants to make some changes, he can easily switch back to the Builder until everything is running as intended.

Running an application in the Run-View

Component Manager

drag&bot supports robots from different brands, as well as various other components, like grippers and cameras. In the Component Manager, users can choose the specific robot and components used in their robot cell.

The corresponding drivers are installed automatically and are ready to use in the Builder.


Configure a robot system in the Component Manager

Guides

Guides are interactive, graphical assistants that guide the user step by step through all the necessary specifications and possibilities of a specific robot application. Thus, even complex tasks can be automated in a short period of time. The results of a guide are drag&bot programs that are ready to run. If required, the resulting program can be further customized in the Builder.

The following Guides are currently available:

- palletizing & de-palletizing – place or pick objects from an uniform grid (for example a blister)
- screwing – select different screw points of an object and create a screwing application
- ... - do you have any ideas or wishes? – Contact us!
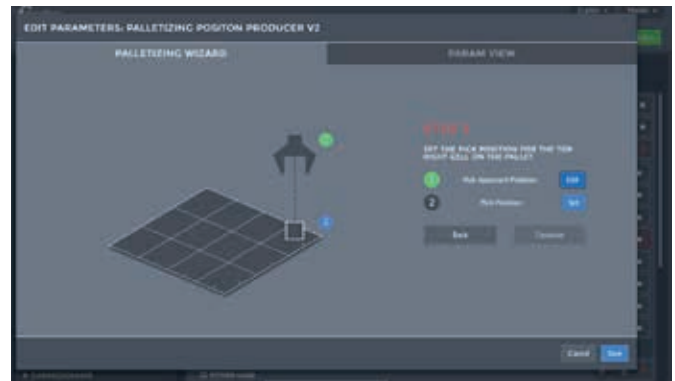
Programming a palletizing application with the PALLETIZING guide

Modules

Modules are additional software extensions of drag&bot that contain advanced features.

These Modules are currently available:

- SENSE: This module enables force-controlled movements of the robot. This feature is often needed for assembly tasks and highly precise operations.
- LOCALIZE: This module detects and localizes parts in the workspace with the help of a camera. This feature is often needed if parts are not exactly located in the workspace and have to be gripped by the robot
- BIN PICKING: This module allows picking unsorted parts out of boxes. This is needed if parts are supplied as bulk material.
- ... - do you have any ideas or wishes? – Contact us!
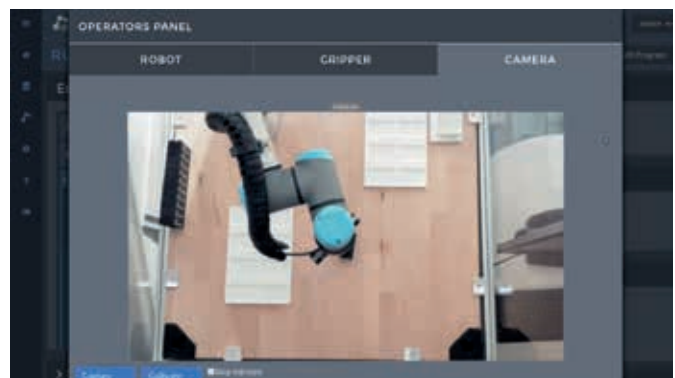
Localization of parts with the LOCALIZE module

DATA SHEET

Features

Robot movements	trajectories with unlimited number of waypoints, parameters for each waypoint: movement type (point-to-point, linear), velocity, acceleration, blending; tool coordinate systems configurable; relative movements
Inputs and outputs	read and write digital and analog inputs of the robot controller
Program structure	loops, conditional branches, parallel execution
Additional functions	palletizing, depalletizing
Program execution	customizable override speed, stepwise execution, immediate stop, user dialogs, visualization of robot movements and program execution
Other	teach panel, user management

Existing interfaces

Robot	Kuka (KRC4 and iiwa), Universal Robot, Denso, Fanuc, ABB
Gripper	electric grippers from Schunk, Weiss, Robotiq, Zimmer. All I / O grippers e.g. from FIPA, Schmalz or Festo
Smart cameras	Sick PIM60
Other	MVTec HalCon: commercial image processing solution
	OpenCV: open-source image processing library
	bp3™: bin picking software solution by Fraunhofer IPA
	We continuously integrate new robots, grippers and cameras. Please contact us if a component you need is not yet included in the list!

## Optional functional packages

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Localize	integration of a 2D camera, simple calibration functions, creation of function blocks for localizing objects with a 2D camera based on the OpenCV image processing library
Sense	several function blocks for force-controlled movements by using an additional force-torque sensor

SYSTEM REQUIREMENTS

drag&bot supports robots from different brands, as well as various other components, like grippers and cameras. In the Component Manager, users can choose the robot/components they want to work with. The corresponding drivers are then installed automatically and the hardware is ready to use instantly.
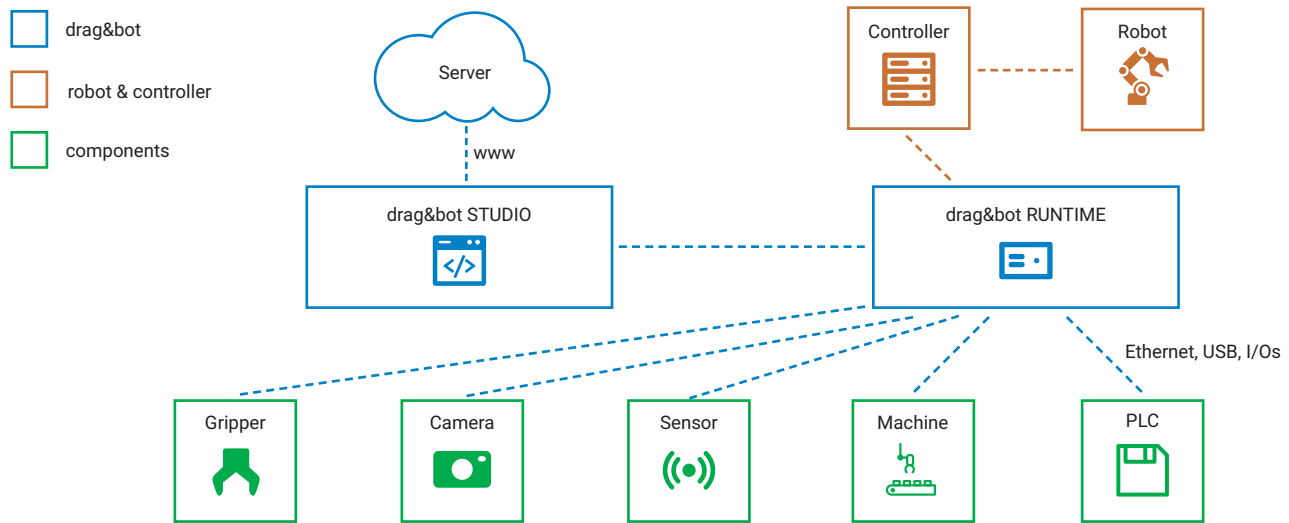
APPLICATIONS
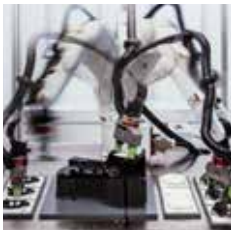
Pick & Place	Assembly	Screwing	Riveting	Soldering

The integration of new components, wizards, guides and modules allows any robot application!

INTERESTED?

drag&bot