

Robostav masonry robot

Development status

Phase 3

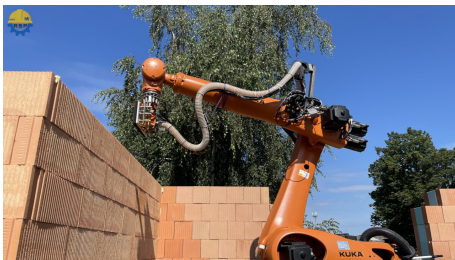
Technology validation and implementing it in real environment. Testing the technology outside of the laboratory and its adjustment to external conditions.

IP protection status

Granted patent CZ 309343 B6 (Robotic masonry system).

Partnering strategy

Co-development, investment, licensing, spin-off



Institution

Czech Technical University in Prague

Vlastník

České vysoké učení technické v Praze

Challenge

The construction industry is facing a significant shortage of skilled bricklayers and rising labor costs. An automated masonry robot solves this problem – it reduces labor, speeds up construction, eliminates human errors and thus increases the accuracy and overall quality of construction. It is a response to a real problem from practice, where it is necessary to build faster, cheaper and in higher quality than traditional methods.

Description

It is an industrial robotic system designed for automatic masonry. The system includes a robotic arm with a gripping tool (grripper) equipped with vacuum suction cups for gripping masonry units and an integrated binder application device (e.g. PUR foam-based adhesives); suction cups are universal and can normally grip any masonry from various manufacturers that will not be specially treated. Based on a digital installation plan (generated from the BIM model of the building), the robot removes bricks from the pallet, checks their dimensions, applies a binder to them and precisely places them in a designated place in the wall according to the coordinates of the plan. The technology was created in the RoboStav laboratory (Faculty of Civil Engineering CTU).

Commercial opportunity

The masonry robot can be used as a service (robot as a service), rental or direct sale of equipment to target customers. Typical users would be construction companies and manufacturers of prefabricated building components. The deployment of the robot brings higher construction speed (up to twice as fast masonry is reported than by a human crew) and the possibility of continuous operation 24/7. The output of the robot's work is consistent and accurate, reducing repair costs and waste. From an operational point of view, labour costs are saved and the technology also contributes to a more sustainable construction industry – less waste is generated during robotic construction and the process can be better planned. In addition, the solution is fully in line with ESG trends and digitization in the construction industry (working with BIM, automation).