

3D printed tool changers for robots

Satakunta University of Applied Sciences has a versatile robotics laboratory which consists of industrial, collaborative, mobile and humanoid robots.

Since there are several laboratory exercises that require different tools, the laboratory needed the ability to change the robot's tools many times a day.

There were a few commercially available quick changers in the laboratory that were used, which proved to be very useful. Because students started to develop their own robot grippers and tools, it increased the need for the quick changers. However, quick changers would end up being very expensive if they were purchased for every tool created and for each robot, because the flange is different on each robot.

Because of the costs of the quick changers and their lack of availability for certain robots, the idea to create a 3D printable quick changer surfaced. Quick changers can be modified to fit any robot that is in the laboratory and any tool or gripper available. Students designed and 3D printed several revisions of quick changers before achieving a working prototype. The designing and 3D printing process was repeated for every tool and robot in the laboratory.

Now students can 3D print the part that fits the robot's flange and design a tool that can be attached to any robot in the laboratory. This solution created the possibility to change any tool to any robot in minutes compared to the 15-30 minutes before, additionally eliminating certain cases where some tools couldn't be installed at all on certain robots.

3D printing has enabled a very cost-effective use of tools between robots, while also allowing more complex designs for the robot tools.



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