Human Computer Interaction
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Bachelorprojekt 2023/24

Operating System for Laser Cutter Appliance

We will give you access to the laser cutter shown below. Like any laser cutter today, this machine requires users to manually calibrate the machine settings and model parameters. However, if users get power and speed wrong, for example, the model may not cut completely or may burn. Getting it right requires substantial expertise and this prevents laser cutters from being used by non-experts.

Help us make this better.

Your objective: Write software that makes a laser cutter smart by creating automatic calibration routines. Design an API to make your system interoperable with existing and future software in the laser cutting domain. Identify and work around (technical) limitations of current laser cutter software and hardware.

Action items: Implement a system that allows for calibration while fabricating. Handle all common design elements as inputs. Select sensors (cameras, touch probes, photoelectric particle counters, custom mechatronics) and build software to control them and the laser cutter. Can you attach these sensors into laser cutters, allowing them to directly perform your new calibration routines?

Your project: Develop and test the new calibration routine. Test and embed your calibration process in a **real-world** application scenario with **real-world** hardware.

And then deploy. Deploy your modified laser cutter at MachBar Potsdam to make a first step towards helping thousands of users worldwide to save time and resources—and thereby extend the scope of personal fabrication to a non-technical audience.

Contact

Email us at martin.taraz@hpi.de and baudisch@hpi.de or come talk in person on the 3rd floor of the main building (H-3.5/6).