

Automatic Calibration for Laser Cutters

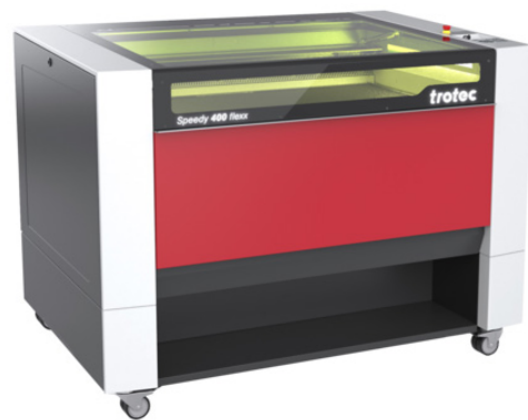
Background: If users get laser cutters' settings (power, speed, etc.) wrong, the model may not cut completely or may burn. Laser cutters thus require users to manually calibrate the machine settings and model parameters. This often takes more time and way more expertise than cutting the actual model. Getting it right requires substantial expertise and this prevents laser cutters from being used by non-experts.

Current status: In the past few months, we have put together a system that improves on the status quo by guiding users through the calibration process. While this majorly helps non-experts to tackle the calibration process, it still requires users to perform the actual calibration steps, thus still costs users' time and distracts them from what they actually want to do, which is to fabricate a model at hand.

Your project: Fully automate the calibration process. Users push the proverbial "green button"—your system does the rest.

(1) We will give you access to our laser cutter, shown below. Write software and build hardware that fully automates all calibration activity. Identify and work around (technical) limitations of current laser cutter software and hardware. Achieve this by selecting appropriate sensors (cameras, touch probes, photoelectric particle counters, custom mechatronics), then 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?

(2) Implement a version of the system that gets rid of the dedicated calibration phase and instead calibrates **while** fabricating.



...and then deploy. Test and embed your calibration process in a **real-world** application scenario with **real-world** hardware. Then deploy your modified laser cutter at a local maker space (the "MachBar Potsdam") to take a 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

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