

# 3D Printing

- Overview and Personal Anecdotes

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## Overview

3D printers are cool! They are a great tool to make both prototypes and low-volume projects. For prototyping, 3D printers allow designers and engineers to quickly iterate on product or part designs. By creating physical models, you are able to identify flaws, test functionality, and refine designs before committing to more involved and expensive manufacturing processes. Low-volume projects that require custom hardware are also made substantially easier. For example, if you needed to deploy a handful of bespoke IoT equipment, you could 3D print just the right quantity of chassis' for all of them, all while avoiding the need for traditional tooling and minimum order quantities.

## Some thoughts

While FDM and SLA printers have recently become mainstream tools, I believe there are still some issues with the user experience and environmental conservation that have yet to be solved.

In my experience, it used to be the case that 3D printers were very finicky things, requiring an inordinate amount of attention to troubleshoot and use. These first-generation machines demanded constant troubleshooting and maintenance, often taking as much time to fix as to actually produce a print. Every detail, from the leveling of the printing bed to the intricate wiring of the stepper motors, could become a source of failure. It felt like these early 3D printers were either minimum viable products or dysfunctional prototypes.

In contrast, the printers of today have features that drastically improve the user experience. These features include intuitive software interfaces, automated bed leveling, wireless connectivity, filament sensors- the whole nine yards. A whole ecosystem of open source software and firmware allowed for the continued evolution of 3D printers into the unmistakably next-generation devices they are today.