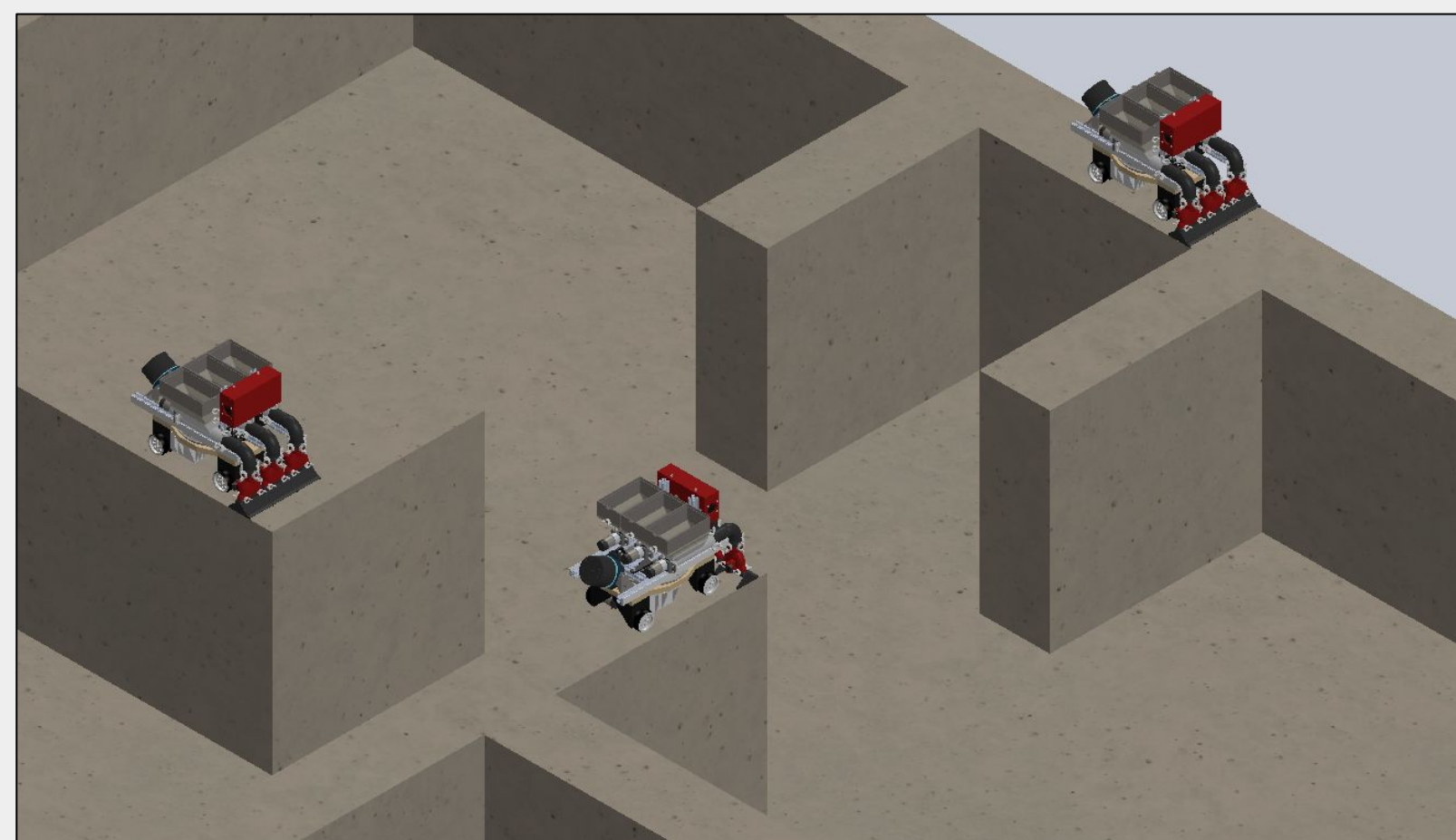


PRIMO: MOBILE CONSTRUCTION 3D-PRINTING ROBOT

Warwick Barker, Colin McGinty, Luke Sanneman, Marc Wehbe
Project Advisors: Mahdi Agheli, Cagdas Onal, Jessica Rosewitz, Nima Rahbar

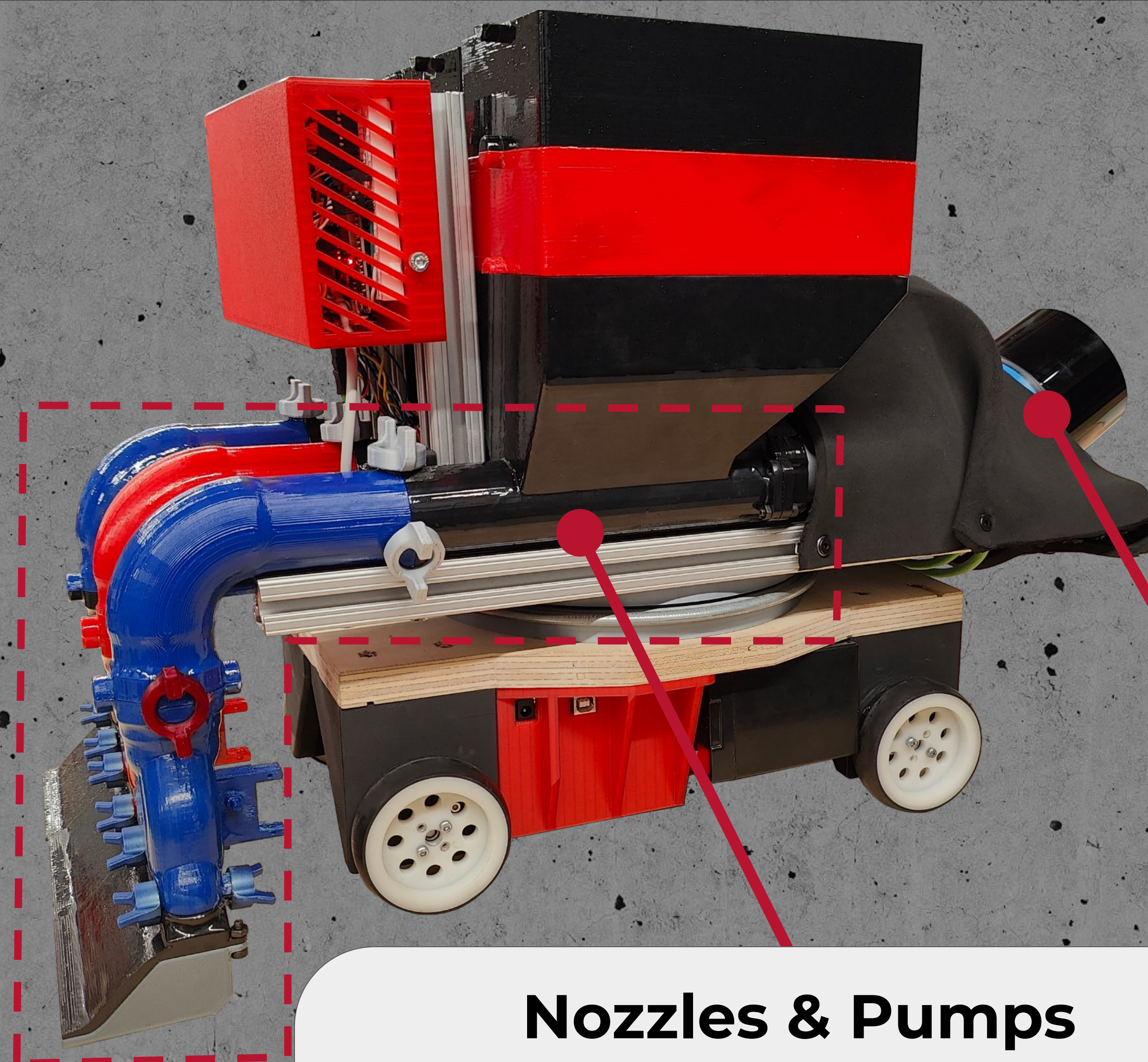
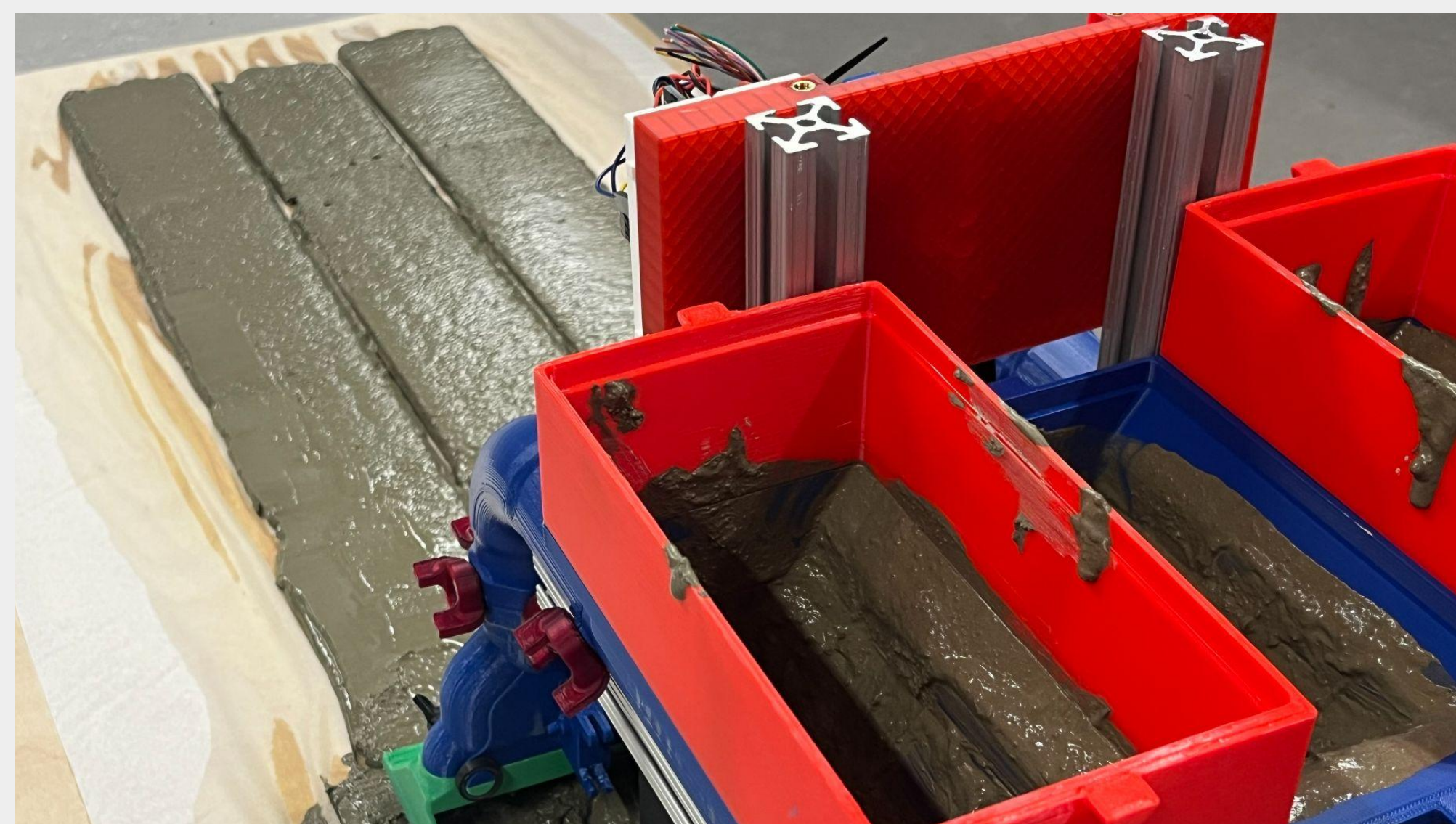
The Idea



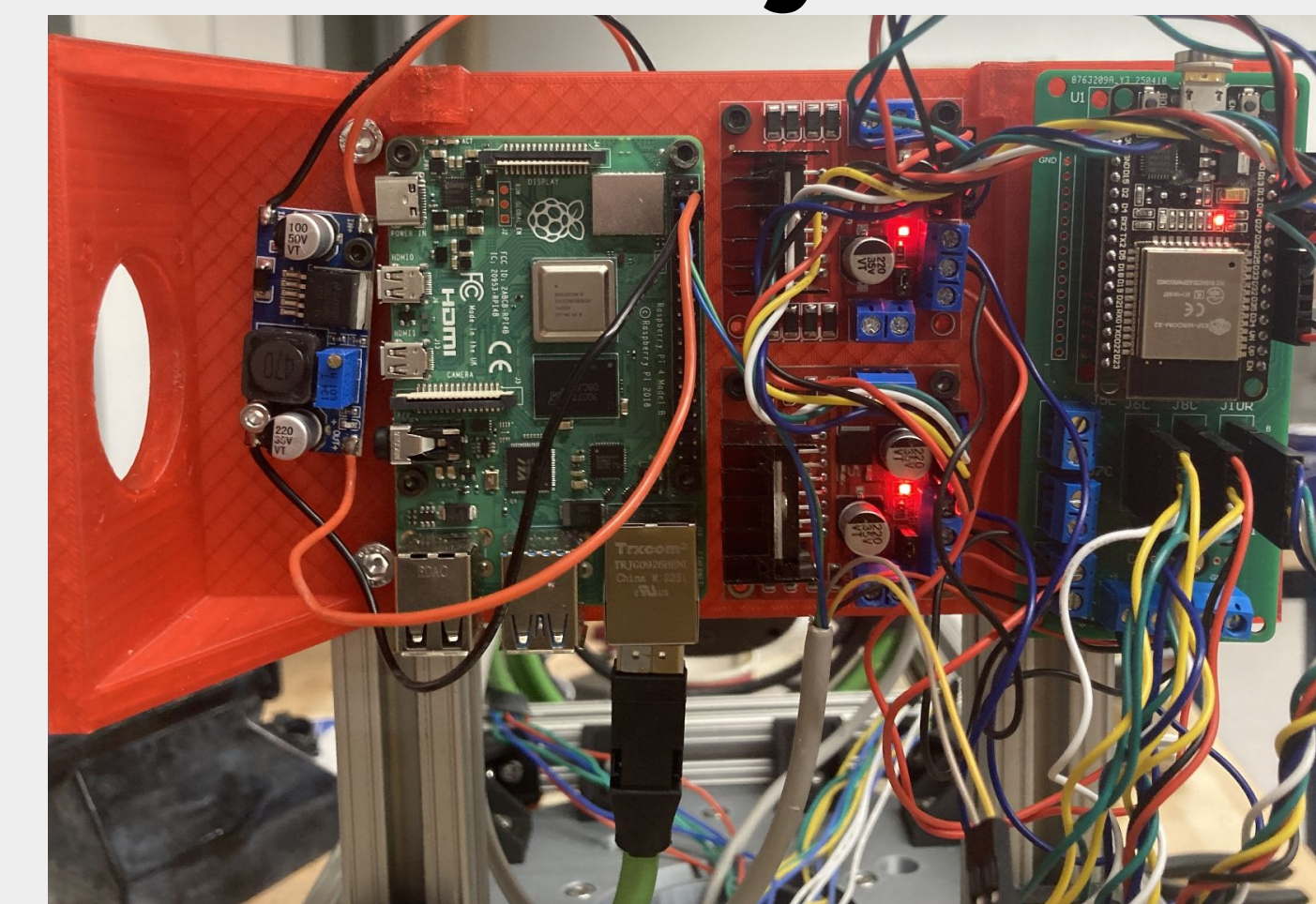
Automate cement laying using small mobile robots with advantages over commercial printing systems:

- Minimal Logistics
- Unlimited Workspace
- Swarm Capabilities
- Planned Redundancy

Testing

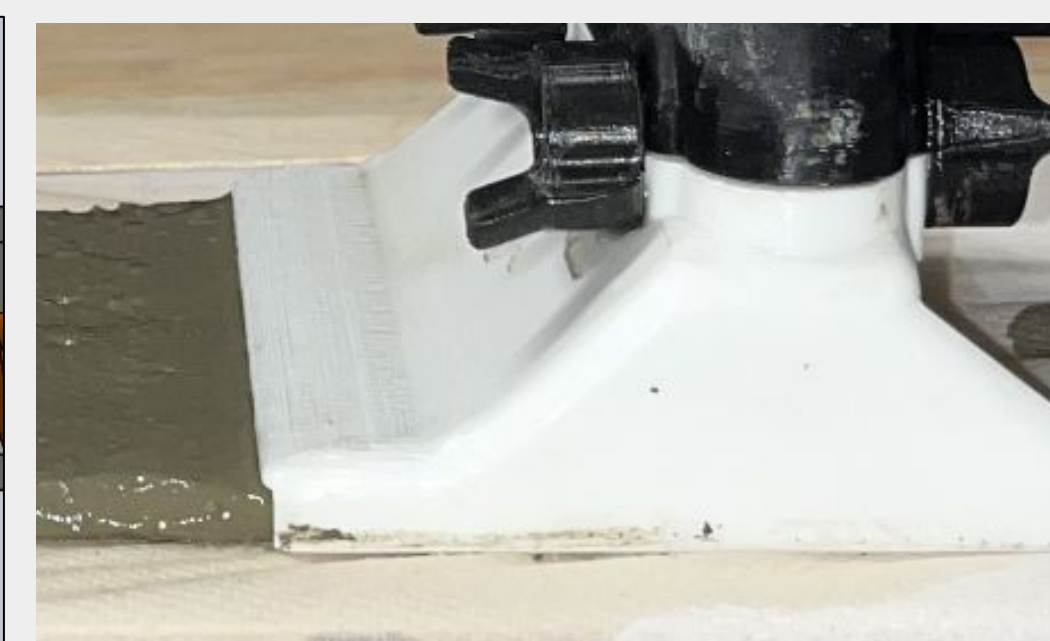
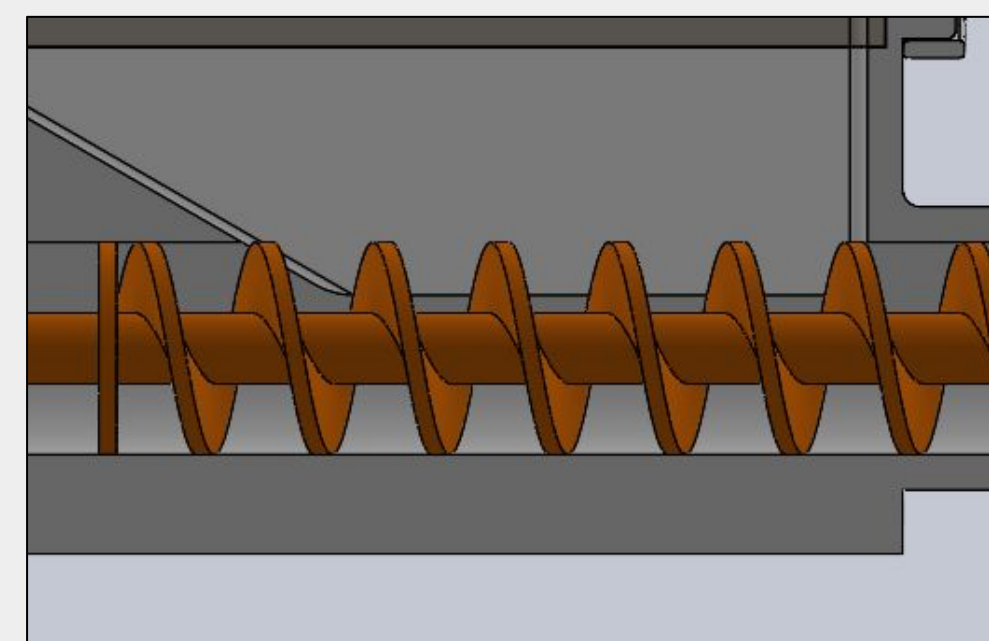


Control Systems



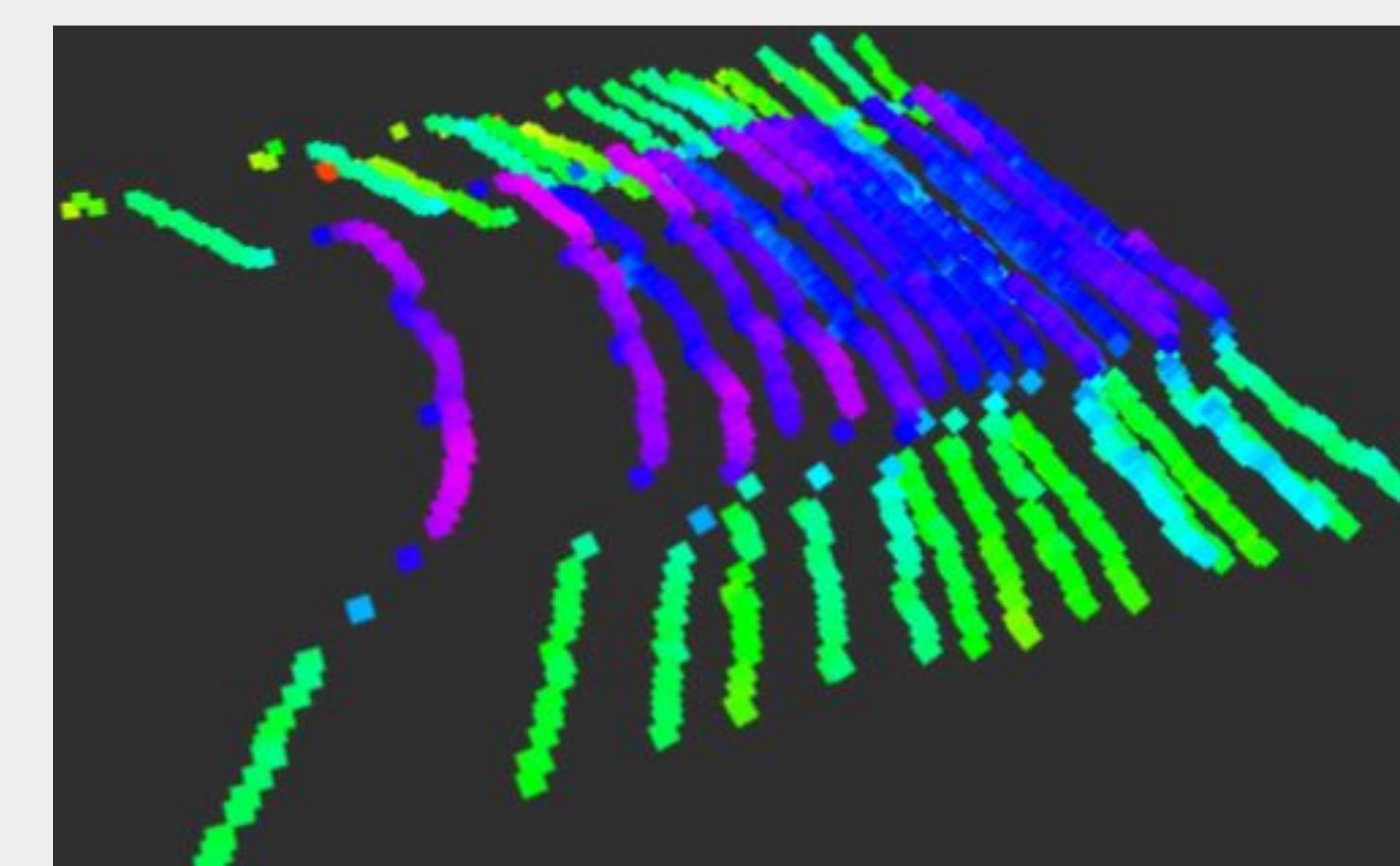
- **Arduino** - program control
- **ESP32** - communication
- **Raspberry Pi 4** - LiDAR data processing and ROS

Nozzles & Pumps



- **Screw Pump** enables continuous flow
- **3 isolated reservoirs** for individual flow control
- Specialized extruder and nozzle for **even and smooth layers**

Multi-Layer LiDAR



- **Edge detection** on previous layers (**blue**), used in **wall centering**
- Global localization