

STUDENT PROFILE

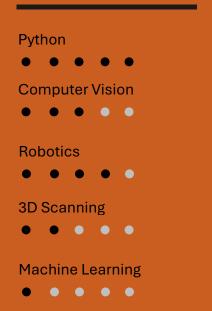
We're looking for a self-motivated automation, software focused mechanical/electronics, or practical computer engineer. Who understands the challenges of soft/hardware integration. The interdisciplinary nature of the project will require you to research & learn outside of the group's expertise. The work is challenging, requires initiative, but will be valuable for careers in robotics & vision-based systems. You will need to stay organized & proactive. If you're up for a tough but rewarding project, we're excited to work alongside you.

CONTACT

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2nd Floor, B22, La Masa Campus (Bovisa)

CORE SKILLS



AUTOMATED DEFTECT ID & NOZZLE ALIGNMENT FOR AM

REPAIR

Prof. Sara Bagherifard PhD Candidates: Roberta Falco



PROBLEM PRESENTATION

When we get a damaged part in for repair we need to do the following:

- 1. Locate the damage
- 2. Get its dimensions (length, width & depth)
- 3. Select a **machining strategy** to remove the damaged material
- 4. Machine a pocket in the part
- 5. Align the Cold Spray nozzle with the newly machined pocket
- 6. Fill the pocket with a predefined Cold Spray tool path

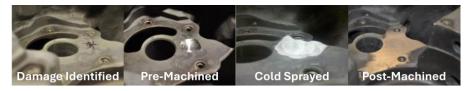
Currently this is **all** done **manually**, by an expert. It's expensive and time consuming which is holding Cold Spray back from being rolled out into all industries.

THESIS DESCRIPTION

Your work will start with aligning the part in the spray booth to the nominal CAD geometry, like this. From there you will need to locate the defect on the part and pull its x, y & z dimensions. With this you will select a suitable machining strategy from a predefined list, which you'll work with a fellow master's student to create, similar to this. Then the nominal geometry would need to be updated to include the new machined feature. Finally, the robot will need to be moved such that the Cold Spray nozzle is aligned with the start point of the predefined infill tool path. The cold spray tool path is defined and generated by your fellow master's student.

APPLICATIONS

At Giga Berlin, a recently fired Tesla engineer hurls a wrench across the factory in frustration. It lands with a sickening *clunk* against a multimillion-euro die, leaving a deep gouge in the precision-machined surface. Normally, this would mean weeks of downtime and a six-figure invoice for a new die.



But with Cold Spray, the damage is repaired within hours. No need for a full remanufacture, just a targeted metal buildup and machining pass. Tesla can keep production moving, no matter how many employees Elon upsets, thanks to Cold Spray.

BASIC INFORMATION

- Duration: 6-9 months
- Immediate start
- Experimental and numerical methods
- Practical & Hands On