Internship: Comparative Evaluation of Robotic Algorithms

SAM XL and the relevance of the position

SAM XL (Smart Advanced Manufacturing XL) is a research center at TU Delft Campus focused on advancing automated manufacturing technologies for lightweight composite structures. SAM XL researches and demonstrates new technologies, techniques, and materials for aerospace applications using robotics, lightweight composites and specialized manufacturing techniques.

This internship focuses on comparing the reliability and efficiency of robotics algorithms for automated inspection and pick-and-place tasks in aerospace manufacturing. The intern will evaluate computer vision techniques (e.g., object detection, defect recognition) alongside non-vision methods (e.g. motion planning) using real-world data. Key metrics include processing time, success rates, and robustness, with findings directly contributing to SAM XL's project on optimizing aerospace manufacturing workflows.

Key Responsibilities:

- Design experiments to compare robotics algorithms (vision and non-vision) for inspection and pick-and-place tasks.

- Analyze performance metrics**:** success rates, false positives/negatives, processing time, and robustness under varying conditions.

- Prepare a comprehensive report comparing algorithm performance and recommending optimal approaches.

- Troubleshoot system integration issues using ROS2, Bash scripting, and Python-based debugging tools.

Required Skills and Qualifications:

- Proficiency in Linux environments and Bash scripting for experimental automation.

- Basic knowledge of XML (for robotic system configuration) and Python (for scripting and debugging in ROS2).

- Interest in industrial robotics (experience with ABB robots or similar systems is a plus).

- Strong analytical skills to interpret complex datasets and derive actionable insights.

Your profile

You are:
- HBO or WO engineering student
- Fast learner & independent worker
- Enthusiastic about robots
- Seeking a 3-5 month internship
- Available from July 2025 (in consultation)

You have experience with:
- Linux environments and Bash scripting for experimental automation
- XML (for robotic system configuration)
- Python (for scripting and debugging in ROS2)

Profile of your potential employer

We offer:

- A cool workspace with a lot of robots
- Access to high-end hardware
- Dynamic and experienced colleagues
- Mentoring in task scoping and implementation
- Exposure to robotic manufacturing technology know-how
- An internship renumeration.

Application Process:
Interested candidates should submit their resume and a cover letter detailing their interest and relevant experience to internships@samxl.com. Applications will be reviewed on a rolling basis until the position is filled.

Join us at SAM XL to gain hands-on experience in robotics.

Contact: internships-samxl@tudelft.nl