

# Experiments in end-to-end learning in automated testing

## Background

A common practice in Software Engineering is to collect data from the regular use of the system and feed back to the development organization to prioritize further development or even learn new requirements. It is not so common to feed back to the testing for the same reasons of optimization and discovery. Sometimes companies perform parallel testing of new, not well tested, components and old working components and retrieve information from this about shortcomings of the new component. However, in practice it is hard to trace the results back in a useful way.

We believe that there would be advantages of viewing the entire testing process as a learning loop, where data from usage is fed back to the test design of automated testing to improve properties such as testing time, coverage, energy used, contributions to establish confidence in the product, and so forth. However, it is hard to convince partners and funders about the feasibility of the idea to progress the idea.

## Task

The task of this master's thesis project is centered around creating a demonstration platform of the idea of learning automated test optimization from usage data. The platform will make the idea concrete to research partners and other stakeholders for continued discussions. The student will have a large degree of freedom in designing the solution.

The student must be prepared to make a literature review about related work and participate in validation of the solution, for instance, by interviewing experts.

We do not expect the student to develop new learning algorithms; it is rather an advantage to use existing libraries.

The final report will be written in English.

## Qualifications

Courses in Software Engineering, preferably including a project course.

Courses in AI/Machine learning and statistics.

Curious attitude and writing skills.

## Start time

During 2023

## Other information

The project can be negotiated to fit two students working together

## Contact person

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