FACULDADE ENGENHARIA
Departamento de Informática

Type Driven Program Synthesis of Input Validation Code

Project Proposal

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Objectives

The goal of this project is to explore type driven program synthesis to automatically generate code for validation of online forms. The creation of validation code for online forms is seen as a boring process and one that can easily result in invalid inputs being accepted. The plan is to explore a tool such as Synquid [1], a program synthesizer based on refinement types, to achieve this goal. Given a set of components and a specification in the form of a refinement type, Synquid automatically generates a functional program that has the given type and may use the provided components [1]. The ultimate goal is to create a workflow that allows the creation of the validation code without the user (e.g. the creator of a website) having to write code. This is an exploratory project that is better suited for Informatics Engineering students with a desire to learn and a keen interest in exploring exciting new approaches.

Work plan and expected timeline

T1 Literature review and initial familiarisation with Synquid
(week 1 → week 3)

T2 Prepare work environment
(week 3 → week 4)

T3 Gather requirements and define design for the solution
(week 2 → week 5)

T4 Implement and test a system to synthesise validation code
(week 5 → week 13)

T5 Evaluation
(week 13)

T6 Report writing
(ongoing throughout the project with the final 2 weeks fully dedicated to report writing)

Expected Output

1. Project report
2. Software tool that synthesises validation code for input forms
3. Conference Paper (depending on results and time available)

Bibliography

[1] Synquid, https://bitbucket.org/nadiapolikarpova/synquid/src/default/