This dissertation proposes a set of new tools for improving automated assessment and debugging, aimed at enhancing both the learning and the teaching of programming.

For textual programming languages, we introduce TESTed and TESTed-DSL, two related frameworks designed to enable and streamline the authoring of programming exercises that can be used across programming languages. The big benefit of this approach is that exercises become more reusable, and the more exercises can be (re)used, the more exercises are available to students.

Young learners, however, have unique needs not covered by textual languages. Hence, they frequently use the block-based programming language Scratch, for which we introduce Itch and Blink. Itch provides comprehensive testing capabilities for Scratch programs, while Blink offers an intuitive debugger, including time-traveling features. These tools empower students to independently receive feedback and correct their mistakes, freeing teachers from spending time generating trivial feedback.

EDUCATIONAL SOFTWARE TESTING for textual and block-based programming languages
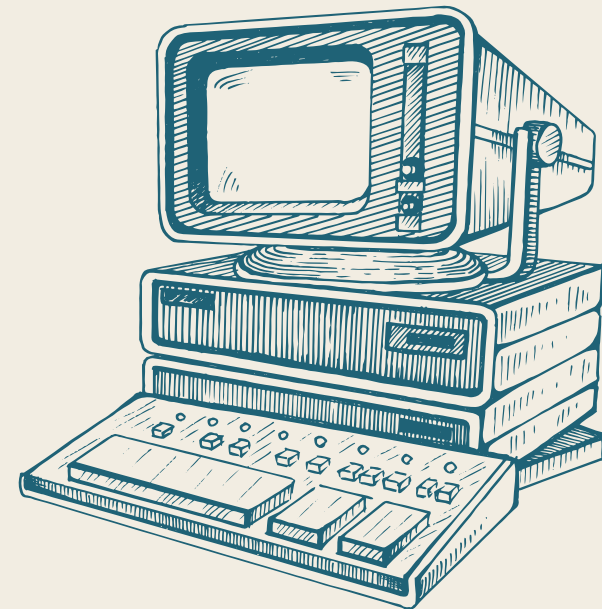
NIKO STRIJBOL

EDUCATIONAL SOFTWARE TESTING

for

TEXTUAL *and* BLOCK-BASED PROGRAMMING LANGUAGES

by NIKO STRIJBOL

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