# Improving Individual Commitment and Assessment in the Module Compiler Construction

Dmitry Ivanov (d.ivanov@tuhh.de)
Florian Meyer (fl.meyer@tuhh.de)

**Abstract**

In the context of this project, the module Compiler Construction is supposed to be adjusted to an increasing number of students. The current course size is around 45 participants split into groups of maximum 4 members. Therefore, the project suggests and implements methods of restructuring practical tasks assigned to groups of students in such a way that the individual contributions become measurable and the individual knowledge gain is increased. For this, the tasks are split into common and individual sub-tasks. The individual parts require searching information on various compiler construction techniques and implementing them as extension of the common base. In addition to that, a single PBL session is designed to facilitate the entry to the code generation exercise session for students with diverging prior knowledge.

For clearer workload split and more trackable individual commitment, the projects are to be submitted through the online tool for source code management GitLab. It also provides an additional mean of communication between students and the teaching assistant. Another enhancement of the affected tasks is creating a test suite promoting gradual solution and using the jury system DOMjudge for automated testing and providing feedback using the aforementioned test set. The PBL session aims to provide a gentle introduction to LLVM API, the library used for the code generation assignments, via going through the Kaleidoscope tutorial and working on a simple exercise in groups. Thus, students have the opportunity to identify the knowledge gaps and tackle common problems before the corresponding project starts.

The project is evaluated with semi-structured interviews, for better understanding of the impact of switching to GitLab, introducing the individual subtasks, and using DOMjudge, and the CheckING questionnaire on effectiveness of the PBL session.

The present didactic concept can scale in two ways: either by increasing the allowed group size or the number of groups. We find that the first approach not only impairs the learning effect for groups larger than 4 but also requires more effort: one has to come up with new individual subtasks and tests for them. On the other hand, for the second approach one needs to reserve additional time for the assessment interviews and adjust the number of DOMjudge judge hosts because testing takes around 5 minutes and hence it is important to allow the sufficient number of submissions to be tested simultaneously.