Semi-automated correction of free-text answers (BA/ MA/ IDP)

The iLab is a series of hands-on lab courses on Computer Networks and Distributed Systems that follows the iLab Concept [1]. From 2003-2020 more than 2000 students participated in one of the iLabs that run currently on three universities in Munich and Tübingen in Germany, and Sydney in Australia.

The iLab workflow [1] aims at providing the best possible learning experience at scale. The most expensive remaining work for the "at scale" factor is the manual correction of the free text answers given by the students.

In this thesis, you will work on support functionality for enabling a semi-automatic correction of student free text answers. Concrete possibilities are:

1) Restructuring the example solutions to lists of common errors / expected results, enabling the tutors to simply check the correct / wrong items.
   The checking should trigger an automated generation of the student feedback and the calculation of the resulting credits.
   Goals:
   - faster correction
   - better correction quality via standardization of process
   - better feedback for students
   a. Correlated to 1), statistics about common errors can be created via data analytics. Reports should be created for the instructors that help structuring the discussion in the next face-to-face meeting to enable specific feedback to the group.
2) Algorithms for comparing texts and highlighting similarities and differences should be implemented.
   a. A first support action is putting apparently similar solutions close to each other.
   b. Highlighting similarities between teams, and to the example solution will make the correction faster and better.
   c. The output of the automated analysis could result in a pre-filling of the criteria from 1)
3) More tools and methodologies for improving the correction are welcome.

[1] M.-O. Pahl, "The iLab Concept: Making Teaching Better, at Scale," *IEEE Commun. Mag.*, vol. 55, no. 11, pp. 178–185, 2017.