Seminar: Machine Learning for Programming

Target audience: M.Sc. students (= Hauptseminar)
Language: English
Organizer: Prof. Dr. Michael Pradel

This seminar is about recent research on improving software and increasing developer productivity by using machine learning, including deep learning. We will discuss research papers that present novel techniques for improving software reliability, security, and performance. Topics of interest include any kind of program analysis based on machine models of code or program executions. The seminar combines topics from program analysis and machine learning:

**Program analysis, e.g.,:**
- Bug detection
- Code completion
- Neural type prediction
- Identifying malicious software

**Machine learning, e.g.,**
- Pre-trained language models
- Recurrent neural networks
- Graph-based neural networks
- Vector embeddings

After the initial kick-off meeting, each student is assigned a research paper. Each student presents her/his paper in a talk during the weekly meetings. Talks are given twice, where the purpose of the first talk is to get constructive feedback for improving the second talk and the student’s general presentation skills. Moreover, each student prepares a term paper that summarizes the original research paper.

More information: software-lab.org/teaching.html