

Semester/Master Thesis Distributed Graph Coloring

Motivation and Informal Description

One of the most fundamental problems in graph theory is (vertex) coloring. Apart from its theoretical appeal, it also has numerous applications in real world in many forms of scheduling, e.g. in multicore systems or in wireless systems. The thesis targets to improve state of the art (distributed) coloring algorithms or to contribute by proving impossibility results. As addition (or alternative) a comparison of existing algorithms (through implementation and benchmarks) is possible. The student can decide to go for a more theoretical or practical focus.

A (much more than expected!!!) outcome on a theoretical investigation might look like [1, 2] (for a practical investigation see [3]).

Offered thesis

The student should have interest in (graph) algorithms and ideally have some background there - the class "Principles of distributed computing" is recommended as basis but not necessary. For a theory focus some persistence is necessary.

Interested? Please contact us for more details!

Contact

- Johannes Schneider: schneider@tik.ee.ethz.ch, ETZ G61.3, phone 044 632 47 76
- Roger Wattenhofer: wattenhofer@tik.ee.ethz.ch, ETZ G63, phone 044 632 63 12

References

- [1] J. Schneider and R. Wattenhofer. A Log-Star Distributed Maximal Independent Set Algorithm for Growth-Bounded Graphs. In *Twenty-Seventh Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing*, August 2008.
- [2] J. Schneider and R. Wattenhofer. A New Technique For Distributed Symmetry Breaking. In *29th Symposium on Principles of Distributed Computing (PODC)*, Zurich, Switzerland, July 2010.
- [3] J. Schneider and R. Wattenhofer. Brief Announcement: Efficient graph algorithms without synchronization. In *29th Symposium on Principles of Distributed Computing (PODC)*, Zurich, Switzerland, July 2010.

