Course Description

1 General

Programming of parallel processors is a complex task due to the multitude of issues the programmer must pay attention to in order to achieve a desired performance. Compilers that perform automatic restructuring of sequential (and parallel) programs for parallelism promise to relief programmers from the more mundane tasks of mapping applications on parallel processors. This course covers the techniques used by today’s state-of-the-art compilers to generate code on parallel processors. Major topics include: Data dependence and dependence testing; loop transformations for locality and parallelism; unimodular transformations; loop scheduling; compilation for distributed memory multiprocessors; automatic data mapping partitioning; optimizations for memory hierarchies; and case studies.

1.1 Instructor

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1.2 Prerequisites

General knowledge of parallel computer architecture and parallel programming; knowledge of compiler design desired but not necessary; AND permission of the instructor.

1.3 Textbook

No textbook will be used in the course; a course pack containing research papers that cover the topics of the course will be made available.

2 Grading Scheme

Students are required to pick a topic related to the course material and prepare a presentation for the class on the topic. In addition, students submit a written paper on the topic by the end of the term. Potential topics and presentation/paper details will be described in class.

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