

CPSC 532D: Topics in Artificial Intelligence

Stochastic Search Algorithms

Holger H. Hoos

Department of Computer Science
University of British Columbia
Canada

General information

Web page: www.cs.ubc.ca/labs/beta/Courses/CPSC532D-05

Time: Tue+Thu 11:00-12:30

Resources:

- ▶ course web page,
- ▶ text book: Stochastic Local Search: Foundations and Applications by H.H.Hoos and T.Stützle (www.sls-book.net),
- ▶ box in the ICICS Reading Room,
- ▶ β -Lab (www.cs.ubc.ca/labs/beta),
- ▶ Holger's brain – pick it :-)

Course Outline (1)

Part 1: Foundations and Basics

- ▶ Module 1: Introduction
- ▶ Module 2: “Simple” SLS Algorithms
- ▶ Module 3: Hybrid SLS Algorithms
- ▶ Module 4: Population-based SLS Algorithms
- ▶ Module 5: Generalised Local Search Machines
- ▶ Module 6: Empirical Analysis of Stochastic Search Algorithms
- ▶ Module 7: Search Space Analysis

Course Outline (2)

Part 2: Applications

- ▶ Module 8: SAT and Constraint Satisfaction
- ▶ Module 9: MaxSAT (and MaxCSP)
- ▶ Module 10: The Travelling Salesperson Problem
- ▶ Module 11: Scheduling Problems
- ▶ Module 12: Other Combinatorial Problems

Final Grades

Final grades are determined as follows:

- ▶ **homework assignments** (simple problems and questions, hands-on use of tools, literature research; approx. one every 2–3 modules) – ca. 25%
- ▶ **topic presentation and discussion** (students prepare the presentation and lead discussions on course topics, based on book chapters and papers) – ca. 15%
- ▶ **course project** (reports and presentations) – ca. 60%

Course Projects

Project groups:

Ideally, 2 students; group size 1–3 may be possible

Timetable for course projects:

01/18 project ideas available

02/08 students submit short project proposals

03/15 students submit short progress report

04/14 students submit final report

Second half of April: project presentations