Pattern Matching Algorithms (Fall 2011)

Room: Students 105, Room 006  Time: W 14:00 - 16:00
Instructor: Prof. Amihood Amir
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Office hours: By appointment or whenever the instructor is in his office.

Text: There will be no textbook. We will use recent papers and class transparencies. See http://www.cs.biu.ac.il/ amir/patmat.html. Possible textbooks on pattern matching are: Text Algorithms by Crochemore and Rytter, Oxford University Press, 1984; Pattern Matching Algorithms by Apostolico and Galil, Oxford University Press, 1997; Algorithms on Strings, Trees, and Sequences by Gusfield, Cambridge University Press, 1997; Jewels of Stringology by Crochemore and Rytter, World Scientific, 2002.

Prerequisites: Algorithms 2.

Course Contents:

Pattern matching problems are among the oldest in computer science. Yet, the area is still a fertile ground for very active current research. Part of its appeal is in its many application domains, such as text editing, computer vision, or molecular biology. Another aspect is that pattern matching has produced or incorporated some novel and powerful algorithmic techniques.

We will investigate various pattern matching problems with particular emphasis on the techniques employed for their solutions.

Syllabus: The following is a tentative schedule.

3. Renaming (Kosaraju, Karp-Miller-Rosenberg).
4. Periodicity (Galil).
6. Suffix Trees (on-line, equal processing time per symbol).
7. Lowest Common Ancestor (Berkman).
8. Convolutions (Fischer-Paterson, Abrahamson).

Grade: There will be a final exam.