

## CS 404-31 - Analysis of Algorithms Research Project

Objective: To explore current techniques and results related to problems introduced during the semester.

Description: A project will consist of an extended abstract (5 to 10 pages) covering advances and current results on a topic selected by a group of students. Each abstract can have between two or three authors.

Topics: The following topics can be selected for the project:

- Shortest Path Algorithms
  - All Shortest Path (ie. Floyd's)
  - Source Point Shortest Path (ie. Dijkstra's)
  - Shortest Path Maps
- Matrix Multiplication
- Sorting Algorithms
- The Traveling Salesperson Problem (TSP)
- Minimum Spanning Trees
- The Knapsack Problem
- RSA Public Key Cryptography
- Binary Search Trees
- Scheduling

Additional topics will be considered at a group request.

Format: Each project should include

- An introduction of the topic, positioning the problem within its context (ie. *“this problem has been introduced by so-and-so in xxxx to address the following need”*)
- Description of the problem
- Common approaches and solutions, with its proper references (minimum 3)
- Solutions for special instances (ie. *The 0-1 Knapsack*)
- A list of open problems (if existant)
- A list of related problems
- The groups point of view on the relevance of the subject and possibilities to explore with it.

Due Date: Projects will be due on Thursday, December 4th. A short presentation of the projects will be given on that date. Proposals for the topic will be due on Thursday, November 6th, in class. Each proposal should enumerate the group composition and the topic selected.