

Gebze Technical University
Computer Engineering Department
CSE 624/424

Homework Statement:

In geometry, circle packing is the study of the arrangement of circles (of varying sizes) on a given surface such that no overlapping occurs (all circles touch one another) so that the total area of the surface is minimized. For example, circle packing in a circle is a two-dimensional packing problem with the objective of packing circles into the smallest possible larger circle.

In this homework we will work on one dimensional circle packing where the circles are packed in a two-dimensional box such that each circle is tangent to the bottom of the box. The problem is to find the box with minimum width and the arrangement of the circles. Note that the height of the box is not important and can be considered to be infinite.

Design and implement solutions to the one-dimensional circle packing problem using following methods. You also have to analyze your solutions (i.e., run your algorithms for several different problems (of various complexities and sizes) and present their performance.)

- Brute-force
- Branch and bound
- Greedy
- Iterated local search
- Simulated Annealing
- Variable Neighborhood Search
- Tabu Search
- Genetic Algorithms
- Particle Swarm Optimization
- Ant Colony Optimization

You may prefer not to design algorithms using two methods you used in your project. Your grade will be based on both application of the method and the performance of the algorithms.

Deadlines:

First 6 methods are due 25.11.2019

The other are due 16.12.2019

Remember that you will have project as well. So it would be better to start earlier.