SORBONNE UNIVERSITÉ
CRÉATEURS DE FUTURS DEPUIS 1257

Algorithmic assessment DAAR 8: Feedback Vertex Set.

BM Bui-Xuan

WARNING :

— Examples of score/marks are available on the UE's website.

— To use the canvas file from the ARI/PPTI TME rooms on the Jussieu campus, line 36 should be uncommented in the `build.xml` file.

Geometric graph : A geometric graph in a 2D plane is defined by a set of points in the plane called vertices, and a threshold on the distance between the points : there is an edge between two vertices if and only if the Euclidean distance between the two vertices is smaller than this threshold.

Feedback Vertex Set : Given a graph $G = (V, E)$, the minimum Feedback Vertex Set (MinFVS) problem consists in computing a minimum sized subset of vertices $F \subseteq V$ such that the subgraph $G[V \setminus F]$ induced by $V \setminus F$ in G is cycleless, that is, $G[V \setminus F]$ is a forest.

1 Assessment for DAAR 8

The overall goal is to propose a heuristics to MinFVS problem in a 2D geometric graph, without budget. In the GUI canvas, V is given by the input file `input.points` and (after parsing,) the variable named `points`. The distance threshold under which an edge exists is given in the variable named `edgeThreshold`.

The evaluation of the assessment will mainly depend on the computing time spent for the 100 input instances of the test (key 'g' in the GUI), and also the clarity of the code (*cf.* Fig. 1)

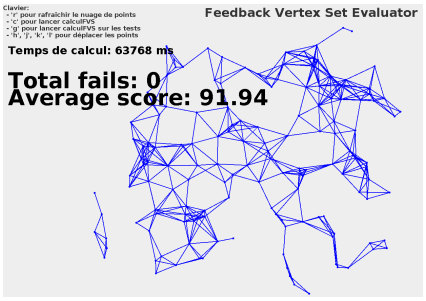

FIGURE 1 – Example of a result obtained over 100 runs using the GUI.

Constraints :

— The sprint is individual work or team of 2.

— Send one screenshot of the result from the GUI (after hitting 'g'), as well as the code of function `calculFVS` to `buixuan@lip6.fr`, 3 emails maximum per team.

— Deadline : 05 December 2021, 23h59, by mail server timestamp. Late report penalty : penalty of $0,1 * 2^k$ points for k minutes late.