

# MSc thesis defense presentation

## Dimitrios Chatzidimitriou defends his

### MSc thesis

<b>Date:</b>	Tuesday, 04 Oct 2016
<b>Time:</b>	11:00
<b>Location:</b>	<a href="#">Univeristy of Athens,</a> <a href="#">Department of</a> <a href="#">Mathematics, University</a> <a href="#">of Athens, room A11</a>
<b>Thesis title:</b>	<a href="#">An Alternative Proof for</a> <a href="#">the NP-completeness of</a> <a href="#">the Grid Subgraph</a> <a href="#">Problem</a>
<b>Committee:</b>	<ul style="list-style-type: none"><li>• <a href="#">Dimitris Fotakis</a></li><li>• <a href="#">Stavros Kolliopoulos</a></li><li>• <a href="#">Dimitrios M.</a> <a href="#">Thilikos</a></li></ul>

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### Thesis abstract

In the field of Graph Drawing, there is great interest for results regarding the embedding of a given graph on a grid, mainly due to the applications on the VLSI circuit design. Moreover, determining whether a graph accepts a unit-length embedding, i.e., a matching of its vertices and edges to vertices and edges of a large enough grid, is the same as asking whether the graph is a subgraph of that grid.

We consider the Grid Subgraph problem, in which given a planar (not necessarily connected) graph  $G$ , we need to determine if  $G$  is isomorphic to a subgraph of a large enough grid. We prove that this problem is NP-complete by employing simple and intuitive gadgets to perform a reduction from a SAT-variant. In addition we prove that a special case of that problem, the  $(k \times k)$ -Grid Subgraph problem, in which the size of the grid is given in the input, is also NP-complete.

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