MSc thesis defense presentation

<u>Αλ■ξανδρος Αγγελ■πουλος</u> **defends**
his MSc thesis

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Thesis title:	[Triangulation Problems on Geometric Graphs - Sampling over Convex Triangulations](#)
Committee:	• [Δημ■τρης Φωτ■κης](#) • [Αριστε■δης Παγουρτζ■ς](#) • [Ευστ■θιος Ζ■χος](#)

Thesis abstract

A geometric graph is a set of points V on the plane and a set of straight line segments E with endpoints in V, potentially and instinctively associated with the abstract G(V,E). When studying its thickness, i.e. partitioning its edges into crossing-free subsets (an NP-hard optimization problem), the problem of triangulation existence as a crossing-free subset T of the edges naturally occurs, as a triangulation of V is the largest such possible set that may be defined on V. In this Thesis, we examine a family of triangulation existence problems and classify them with respect to their complexity, both for their decision and their counting versions. The general case decision problem is the only one appearing in bibliography (Lloyd, 1977, NP-hard), while we deal with the convex case restriction and an "intermediate" polygon triangulation existence problem, fixing a new 2 by 2 table of results. In the final chapter, we modify our framework in order to build an exact uniform sampling and optimal coding algorithm for convex triangulations, which outperforms any known algorithm to date.