

# LEARNING, PROCESSING AND OPTIMISING SHAPES



MARIE SKŁODOWSKA-CURIE EUROPEAN

TRAINING NETWORK // DEC. 2019 — NOV. 2023

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GRAPES aims at significantly advancing the state of the art in a variety of fields ranging from Computational and Numerical Mathematics, to Geometric Modelling and CAD, up to Data Science and Machine Learning, in order to promote game changing approaches for generating, optimising, and learning 3D shapes.

Research is articulated around three scientific work packages:

1. High-order methods and representations
2. Algebraic & numeric tools in shape optimisation and analysis
3. Machine Learning for shapes

Concrete applications include simulation and fabrication, design and visualisation, manufacturing and 3D printing, retrieval and mining, reconstruction and urban planning.

Our 15 PhD candidates shall benefit from both top-notch research as well as a strong innovation component through a nexus of intersectoral secondments and Network-wide workshops.

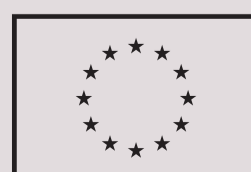
Innovation and technology transfer is supported by the active participation of SMEs, either as beneficiary, or as associate partners hosting secondments.

## 15 open PhD positions starting before 30 Nov 2020:

1. ATHENA Research Center: Optimised predicate toolbox for geometric design and processing
2. ATHENA Research Center: Deep learning of 3D shapes for retrieval
3. U. Barcelona: Extraction of geometric primitives from 3D point clouds
4. U. Barcelona: ML and interactive 3D visualisation of temporal point clouds for predicting morphological changes
5. Inria Sophia Antipolis: Generation of valid high-order curved meshes
6. Inria Sophia Antipolis: Modelling and simulation using analysis-suitable subdivision surfaces and solids
7. JKU: Algebraic methods in multiview geometry
8. RWTH Aachen: Machine Learning for Geometric design
9. SINTEF: Geometric modelling for evolutionary deep learning architecture design
10. U. Strathclyde: Shape optimisation via IGA, locally refinable parametric modellers and dimensionality reduction
11. U. della Svizzera italiana: Geometric deep learning for shape analysis
12. U. della Svizzera italiana: Barycentric rational curves and surfaces
13. U. Tor Vergata: Multi-degree spline technologies for isogeometric analysis
14. U. Vilnius: Circular meshes and cyclidic splines of arbitrary topology
15. GeometryFactory: Piecewise smooth reconstruction of 3D scenes from raw point sets

## Apply now:

<http://grapes-network.eu> (grapes@athena-innovation.gr)



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