

ALGEBRAIC REPRESENTATIONS IN COMPUTER-AIDED DESIGN FOR COMPLEX SHAPES



MARIE SKŁODOWSKA-CURIE EUROPEAN TRAINING NETWORK
JAN. 2016 — DEC. 2019

Members

ATHENA RESEARCH CENTER
(GR, coordinator)

U. BARCELONA (ES)

INRIA (FR)

J. KEPLER U. LINZ (AT)

SINTEF (NO)

U. STRATHCLYDE (UK)

T.U. WIEN (AT)

EVOLUTE GMBH (AT)

Industrial partners

HELLENIC REGISTRY
OF SHIPPING (GR)

HUE AS (NO)

MISSLER SOFTWARE (FR)

RISC-SOFTWARE (AT)

TRANSCENDATA (UK)

ARCADES aims at disrupting the traditional paradigm in Computer-Aided Design (CAD) by exploiting cutting-edge research in mathematics and algorithm design. Geometry is now a critical tool in a large number of key applications; somewhat surprisingly, however, several approaches of the CAD industry are outdated, and 3D geometry processing is becoming increasingly the weak link. This is alarming in sectors where CAD faces new challenges arising from fast

point acquisition, big data, and mobile computing, but also in robotics, simulation, animation, fabrication and manufacturing, where CAD strives to address crucial societal and market needs. The challenge taken up by ARCADES is to invert the trend of CAD industry lagging behind mathematical breakthroughs and to build the next generation of CAD software based on strong foundations from algebraic geometry, differential geometry, scientific computing, and

algorithm design. Our game-changing methods lead to real-time modelers for architectural geometry and visualisation, to isogeometric and design-through-analysis software for shape optimisation, and marine design & hydrodynamics, and to tools for motion design, robot kinematics, path planning, and control of machining tools. These areas correspond to topics for the 13 PhD theses to be undertaken at ARCADES member teams.

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



THIS PROJECT HAS RECEIVED FUNDING
FROM THE EUROPEAN UNION'S HORIZON 2020
RESEARCH AND INNOVATION PROGRAMME
UNDER THE MARIE SKŁODOWSKA-CURIE
GRANT AGREEMENT NO 675789