PROJECT

PHAROS

Physical Architecture Optimization System

Funding: European (Horizon 2020)

Duration: Oct 2019 - Mar 2021

Status: Complete

Total project cost: €500,000

EU contribution: €500,000

Call for proposal: H2020-CS2-CFP09-2018-02

CORDIS RCN : 225406

Objectives:

The aim of the project PHAROS is the development, implementation and demonstration of a fully instrumented, automated and simulation-enabled engineering software platform capable to automate the whole manual model-based systems engineering (MBSE) design process for physical systems architecture generation and optimisation, under special consideration of (but not limited to) automated optimal packaging, piping and routing generation of an aircraft wing section assembly which complies to a given set of engineering constraints.

In order to achieve this, graph-based design languages in UML (Unified Modelling Language) are used to develop an automated, algorithmic implementation of interoperable engineering services for packaging, piping and routing. Design languages are executable in the software platform Design Compiler 43 of one industrial project partner and may be coupled for optimization purposes with the optimizer software Optimus of the other industrial partner.

Graph-based design languages are inspired by human languages, in which the vocabulary and rules form a grammar. The term 'design language' means that every sentence allowed by the grammar is a valid expression of a design. The term 'graph-based' means that each node in a graph is used to represent a requirement, a function, a solution principle, a component or any other arbitrary engineering expression one may encounter in the product lifecycle. This graphical representation of the design product and design process in form of a graph-based language is translated by a compiler into the disciplinary models of packaging, piping and routing in order to draw conclusions for the further optimization of the designs.

The automation of model-based systems engineering (MBSE) with a machine-executable V-Model will push the competitiveness of European aerospace companies to a new level of efficiency and will permit a unique selling proposition of innovation and cost leadership enabled by automation.

Parent Programmes:

H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Other programmes: JTI-CS2-2018-CfP09-SYS-03-21 - Aircraft wing architecture optimal assembly

Lead Organisation:

Universität Stuttgart

Address:
Keplerstraße 7
106037 STUTTGART
Germany

Organisation Website:
http://www.uni-stuttgart.de

EU Contribution: €217,250

Partner Organisations:

Iils Ingenieurgesellschaft Fur Intelligente Losungen Und Systeme Mbh

Address:
ALBSTRASSE 6
72818 TROCHTELFINGEN
Germany

EU Contribution: €205,375

Noesis Solutions Nv

Address:
GEENSLAAN GASTON 11 GEBOUW 4
3001 LEUVEN
Belgium

Organisation Website:
http://www.lmsintl.com

EU Contribution: €77,375

Technologies:

Aircraft design and manufacturing
Aircraft design model

Development phase: Research/Invention

STRIA Roadmaps:
Cooperative, connected and automated transport, Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Digitalisation

Geo-spatial type: Other