Press Information
Start of ITEA3 Project UPSIM – Unleash Potentials in Simulation

Credible Digital Twins will be the game changer for accelerating innovation and reducing development costs in different industries: Within the new project UPSIM vehicle manufacturers, research institutes and suppliers have joined forces to help industry convert from massive physical to enriched virtual prototypes.

Imagine if you could essentially give up building physical prototypes, and instead design and develop products in a fully digital process.

And if you could test the product in a real environment under reliable, factual conditions using virtual models, and when artificial intelligence is in place during product operation for continuously enriching models and their maturity over time. Furthermore, a digital twin could predict and alert when the product no longer behaves as expected …

This is the purpose of the new research and development ITEA3 UPSIM Project, which kicks off in October 2020 and is projected to finish September 2023. The project consortium consists of **31 leading European manufacturers, suppliers and research institutes**, which are jointly working on increasing trust in Modelling & Simulation for virtual development. The project is coordinated by the German subsidiary of VIRTUAL VEHICLE Research GmbH, Austria:

“This is the time to bring Modelling and Simulation to its next level - it’s all about the economic value of digital twins unleashed by ensured credibility and trust”, stated by the Dr. Martin Benedikt from VIRTUAL VEHICLE Research Center, representing the UPSIM project coordinator.

Dr. Martin Benedikt
VIRTUAL VEHICLE Research Center
UPSIM Project Coordinator
martin.benedikt@v2c2.de

Credibility is identified as key enabler for Return of Invest

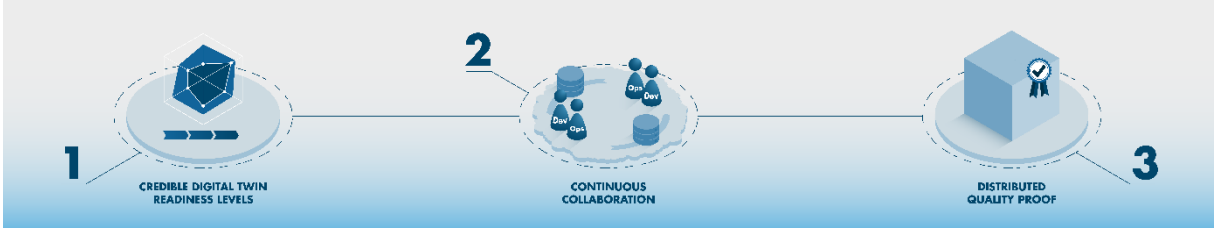
Modelling and Simulation is used in many industries for supporting classical system design, early-stage testing, or virtual commissioning. All these current applications of modelling and simulation have one thing in common – finally, expensive real testing is mandatory. Taking the related CA*X* costs (education, tool license fees, IT infrastructure, etc.) into account someone could reasonably ask for a positive and timely return of invest in modelling and simulation.

The essential value of modelling and simulation is seen twofold: by the support in early-stage decisions making and the replacement of a significant number of real tests. But as long as simulation possess unclear modelling and approximation gaps to the corresponding real-world system at hand, these potentials will not be accessible, and the current situation will not change.

Therefore, the UPSIM consortium identified **credibility** in system modelling and simulation as the key enabler for return of invest, where compared to software development modelling and simulation quality is ensured by processes and evaluation models.

Three steps to Credibility Digital Twins

For tackling the stated challenges, the UPSIM Project proposes a three-layers solution approach for ensuring credibility in modelling and simulation for unleashing broad scale economic value.



1) Defining “Credibility”: In a first step simulation targets and relevant stakeholders are clarified for determining required modelling and simulation quality according decision and test criticality. There is a strict need for open access reference processes and digital twin readiness levels delivered by UPSIM.
2) Developing Credible Digital Twins: When targets are clarified, traceable and collaborative digital twin development is conducted via continuous testing approaches ensuring a continuous tracking of modelling and simulation maturity based on massive automation utilization for data analysis, reasoning, and machine learning.
3) Optimizing Usability: Digital signatures will ensure the unique identification and traceability of development artefacts for encapsulation of complex simulations (SimApps) for utilization by non-experts. Which finally leads to a more competitive modelling and simulation market on long term.

Comprehensive expertise from a broad partner landscape

UPSIM represents a **Pan-European innovation action** and is coordinated by the German branch of VIRTUAL VEHICLE. The involvement of project partners from seven countries leads to an effective interlinkage of several technology-specific hotspots within Europe. The consortium is complemented

Dr. Martin Benedikt
VIRTUAL VEHICLE Research Center
UPSIM Project Coordinator
martin.benedikt@v2c2.de

by scientific key persons, links to relevant standardization bodies and local industrial clusters for ensuring a smooth innovation provision and a rapid market-uptake as well. The partners cover **complete value-chains** within agriculture, healthcare, automotive and smart building domains for implementing UPSIM results in a multi-disciplinary and multi-domain fashion.

During the **three-year project period** (starting October 2020) the consortium can also be expanded with additional project partners based in the ITEA3 funding framework.

A central goal of UPSIM is to transfer standardization results to enable broad access and rapid market penetration. Therefore, partners from relevant standardization bodies (Modelica Association and ASAM) are involved, focussing on standards that are easy to use in the industry.

The project in a nutshell

The ITEA3 UPSIM project has a total budget of about EUR 16 million and is coordinated by the German subsidiary of VIRTUAL VEHICLE Research GmbH, Austria.

UPSIM will bring Digital Twins to the next level by adding credibility. The project shall enable companies to safely collaborate with simulations – in a repeatable, reliable, and robust manner. It will support implementing simulation in a Credible Digital Twin setting. The aim is to achieve a strategic capability to become an important factor in quality, cost, time-to-market, and overall competitiveness.

Duration: October 2020 – September 2023

Project management: VIRTUAL VEHICLE Research GmbH (German subsidiary)

31 partners: *Austria:* Virtual Vehicle Research GmbH, *Denmark*: Aarhus University, Agro Intelligence ApS; *Germany*: 3D Mapping Solutions GmbH, Audi AG, Automotive Solution Center for Simulation e.V., Deutsches Zentrum für Luft- und Raumfahrt (DLR), iCONDU GmbH, LTX Simulation GmbH, Robert Bosch GmbH, Technische Universität Berlin, University of Augsburg, Virtual Vehicle Research GmbH, Volkswagen AG, Infineon Technologies AG, Softwarehelden GmbH & KG; *Netherlands*: Eindhoven University of Technology, In Summa Innovation b.v., KE-works, LifeTec Group BV, NLR - Royal Netherlands Aerospace Centre, Philips Electronics Nederland BV, Philips Consumer Lifestyle B.V., Reden BV, Sioux Mathware, Unit040 Ontwerp B.V., University of Groningen *Romania*: BEIA Consult International, Lucian Blaga University of Sibiu; *Spain*: NETCheck S.A.; *United Kingdom*: The Manufacturing Technology Centre (MTC)

7 countries: Austria, Denmark, Germany, Netherlands, Romania, Spain, United Kingdom

Project website:

https://itea3.org/project/upsim.html

Dr. Martin Benedikt
VIRTUAL VEHICLE Research Center
UPSIM Project Coordinator
martin.benedikt@v2c2.de

Quotes from the industry

"As a HealthTech company, we have a unique opportunity to collaborate with automotive and aerospace companies and institutes that are leading in the ongoing digitalization. We are very eager to kick-off the UPSIM project, which will establish Credible Digital Twins as strategic capability and will quantify maturity, quality, robustness and accuracy of the digital model representations by means of the novel Digital Twin Readiness Level metric."

Ger Janssen – department head Philips Research and Program Manager Patient Digital Twin

"For Audi, UPSIM means a big step towards coping with the upcoming complexity of modern vehicles embedded in traffic systems. Together with specialists also from non-automotive industries, we invest into efficient and effective development approaches, containing simulation models for mobility functions. Bundling these expertise's to smooth collaborative engineering approaches supported by verifiable digital twins is the key for addressing future challenges."

Lutz Morich - PMT virtuelles Umfeld / PL Forschungsprojekt SAVe - AUDI AG

About VIRTUAL VEHICLE

The Virtual Vehicle Research GmbH is Europe's largest R&D center for virtual vehicle technology with 300 employees. Research priority is the linking of numerical simulations and hardware testing, which leads to a powerful HW-SW whole system design and automation of testing and validation procedures. Following this focus on industry-related research VIRTUAL VEHICLE is a successful innovation catalyst for future vehicle technologies.

The international partner network of VIRTUAL VEHICLE consists of around 100 national and international industrial partners (OEMs, Tier 1 and Tier 2 suppliers as well as software providers) as well as over 40 national and international scientific institutions.

Virtual Vehicle Research GmbH has received funding within COMET Competence Centers for Excellent Technologies from BMK, BMDW, the Province of Styria (Dept. 12) and the Styrian Business Promotion Agency (SFG). The Austrian Research Promotion Agency (FFG) has been authorised for the programme management.

Contact:

Dr. Martin Benedikt
VIRTUAL VEHICLE Research Center
UPSIM Project Coordinator
martin.benedikt@v2c2.de

Dr. Martin Benedikt
VIRTUAL VEHICLE Research Center
UPSIM Project Coordinator
martin.benedikt@v2c2.de

Bild 1: UPSIM Logo

Copyright: VIRTUAL VEHICLE

Download Picture

Bild 2: Key Visual UPSIM

Copyright: VIRTUAL VEHICLE

Download Picture

Bild 3: Three steps to Credibility Digital Twins

Copyright: VIRTUAL VEHICLE

Download Picture

Dr. Martin Benedikt
VIRTUAL VEHICLE Research Center
UPSIM Project Coordinator
martin.benedikt@v2c2.de