

# Daimler Protics GmbH

## COMPANY INFORMATION

- As internal service providers we assist and advise Daimler AG in design, optimization and implementation of processes, methods and systems for complex product data
- We design, develop and provide Virtual Engineering products and services along the entire Product Life Cycle with 150 employees in our Virtual Engineering department

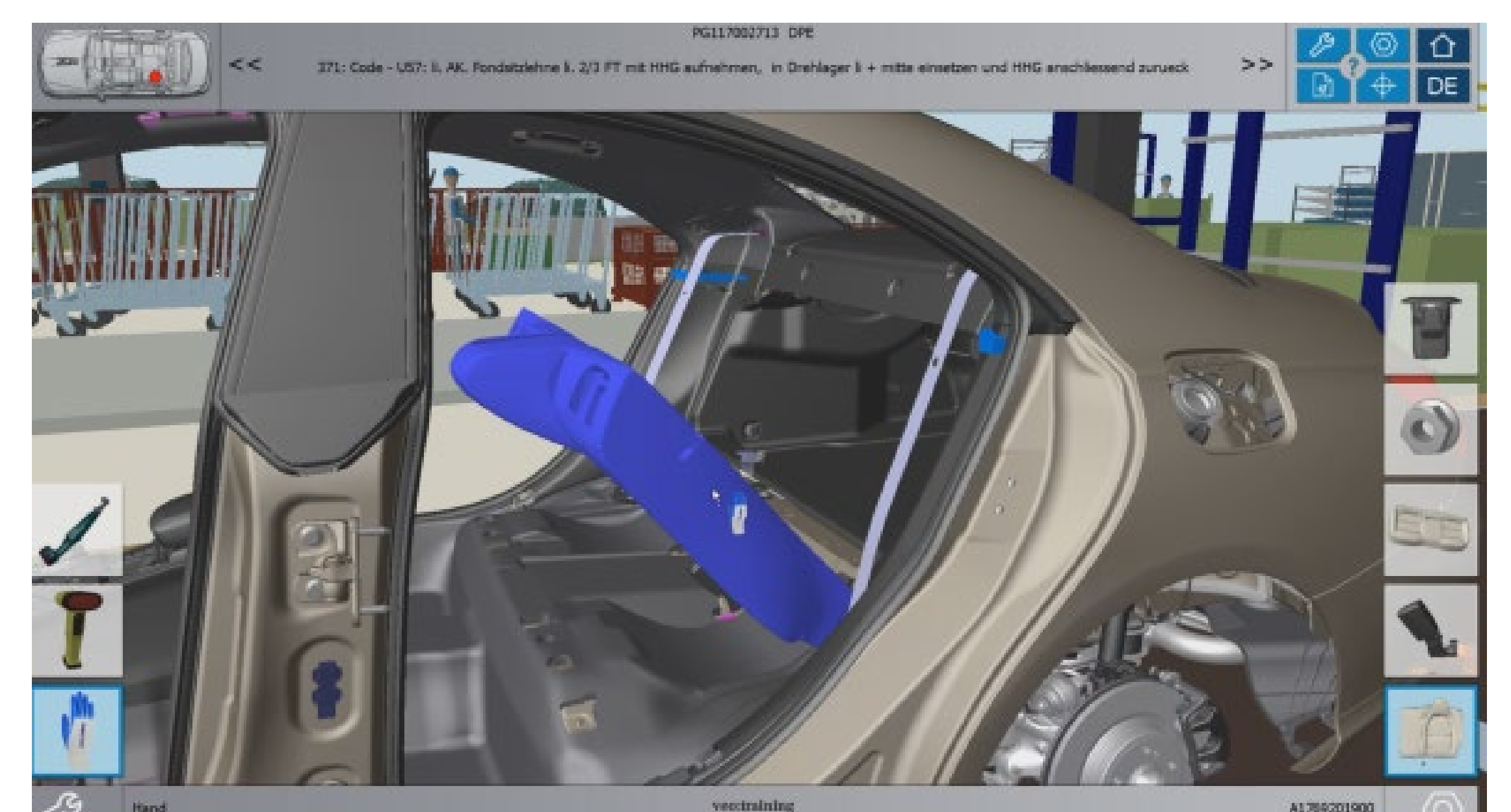


## ROLE IN MOSIM

- Position in value chain:
- Contribution within MOSIM
  - ✓ Definition of automotive requirements on MMUs
  - ✓ MMU-library
  - ✓ Demonstrators verification

## PARTNER SPECIFIC INTEREST

Daimler Protics expects gain of knowledge in simulation of assembly processes to improve their virtual assembly training. Also Daimler Protics wants to extend the consulting portfolio with additional experience of ergonomic aspects out of MOSIM.



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# DAIMLER AG

## COMPANY INFORMATION

- Various enterprises in automotive industry and biggest producer of premium cars
- 289.000 employees, thereof 4.200 in production planning
- Extensive range of vehicles as well as globally distributed production plants

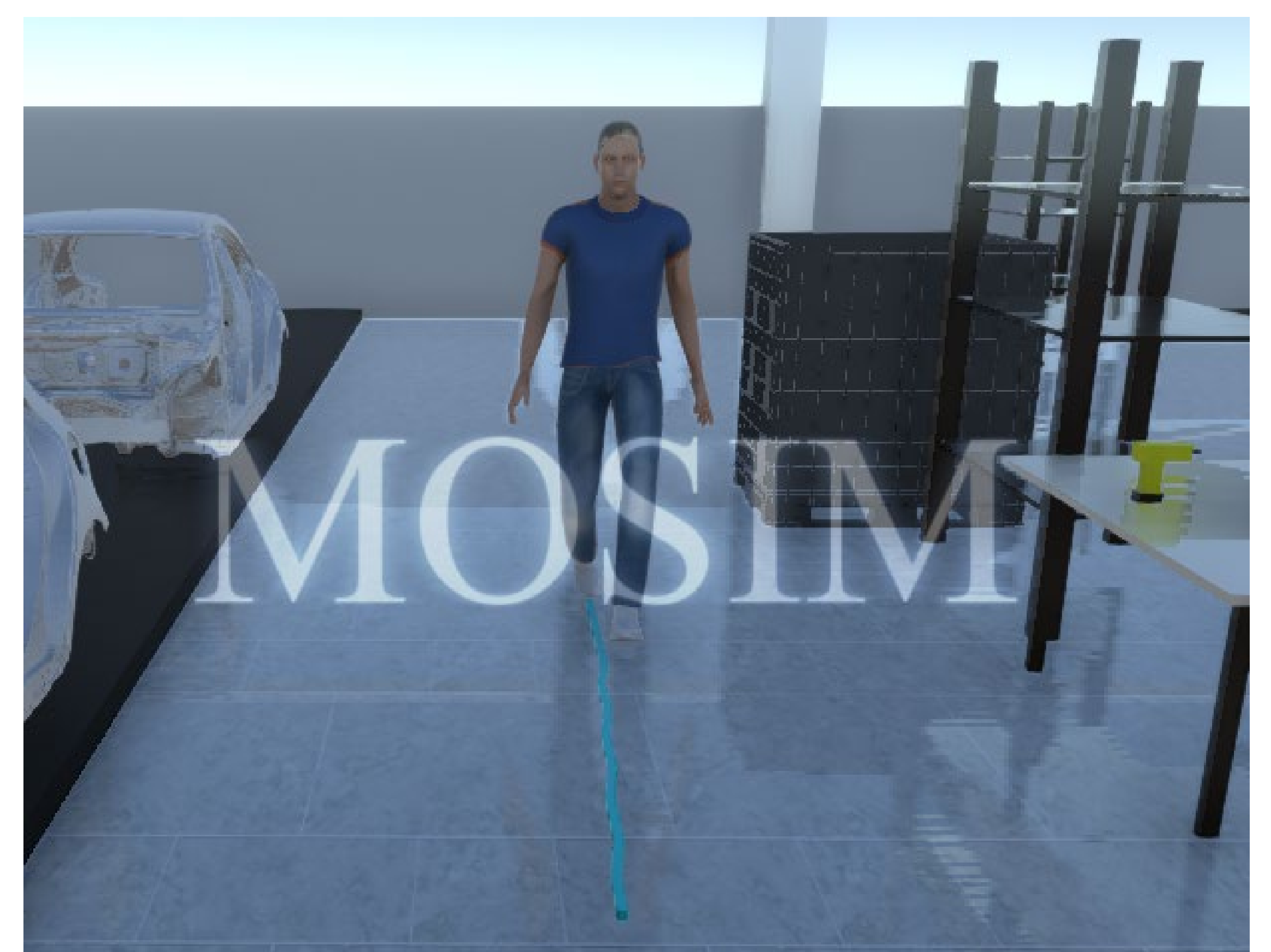


## ROLE IN MOSIM

- Position in value chain: OEM / automotive manufacturer
- Contribution within MOSIM
  - ✓ International / national consortium leader and project management
  - ✓ MMU architecture
  - ✓ Co-simulation
  - ✓ Demonstrator

## PARTNER SPECIFIC INTEREST

Proof-of-concept demonstrator, which underlines the potential of modular human simulation approaches and gaming platforms for planning manual assembly tasks. Furthermore, MOSIM is regarded as a key pillar towards the vision of autonomous planning.



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# Dark Amber Softworks

## COMPANY INFORMATION

- Dark Amber Softworks was founded in November 2013 in Kouvola, Finland. We are a multi-disciplinary media consortium focusing on creating digital content. While our primary focus is virtual reality and entertainment applications, we also produce concept visualization, ebooks and UI & UX design.
- Mika Ronimus – Henri Brandt – Richard Mc Grath

## ROLE IN MOSIM

- Position in value chain: Virtual reality and entertainment applications
- Contribution within MOSIM
  - AI tool provider
  - Human modelling
  - Demonstrator



## PARTNER SPECIFIC INTEREST

- Environment modelling – Human modelling – AI – VR – AR – UI – UX

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# Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI)

- Leading research center in Germany for innovative commercial software technology using Artificial Intelligence
- Over 980 employees in 18 research departments in 5 research facilities



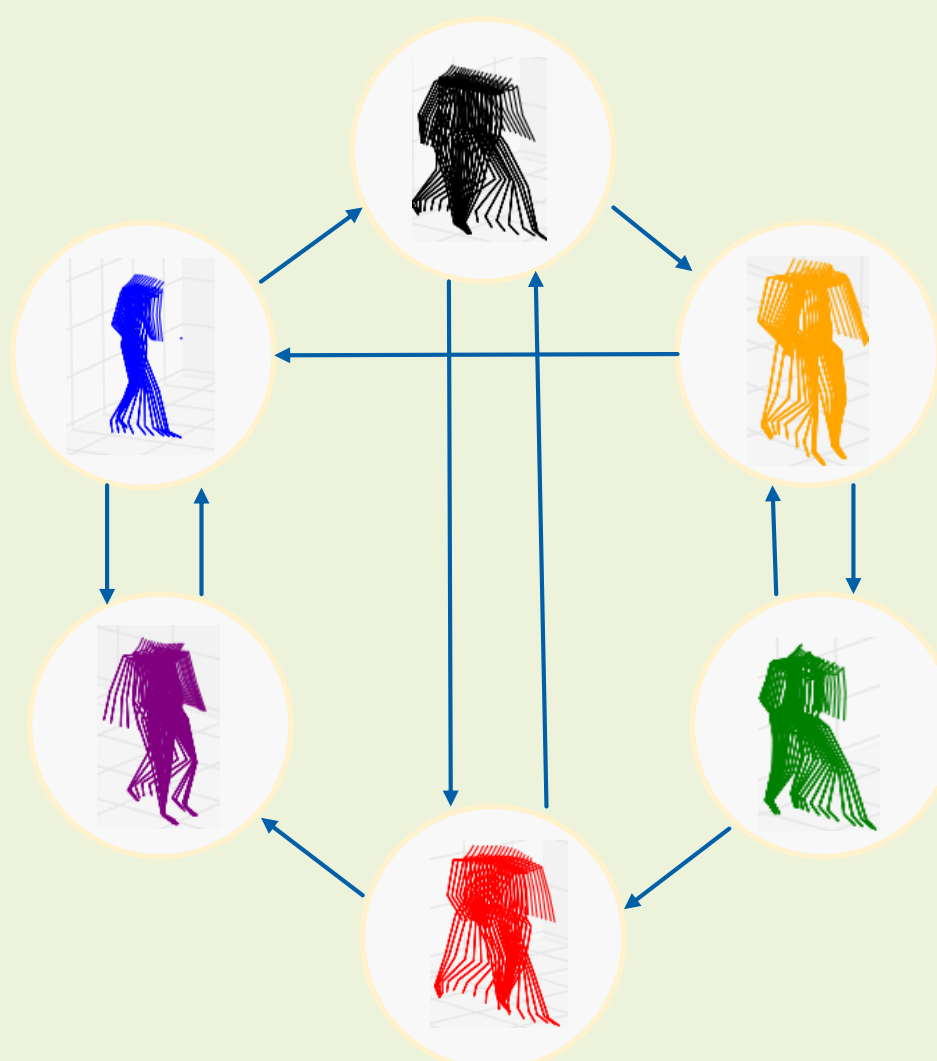
## Role in MOSIM

- Technology Provider
- Major Contributions within MOSIM
  - data-driven motion synthesis (statistical, stylistic, hierarchical, deep learning) [WVP 3]
  - behavior modelling and reasoning [WVP 4]
  - Co-Simulator (model mapping, constraint language, transition model) [WVP 5]

## Partner Specific Interest and Expertise

### Motion Synthesis

Statistical Motion Synthesis



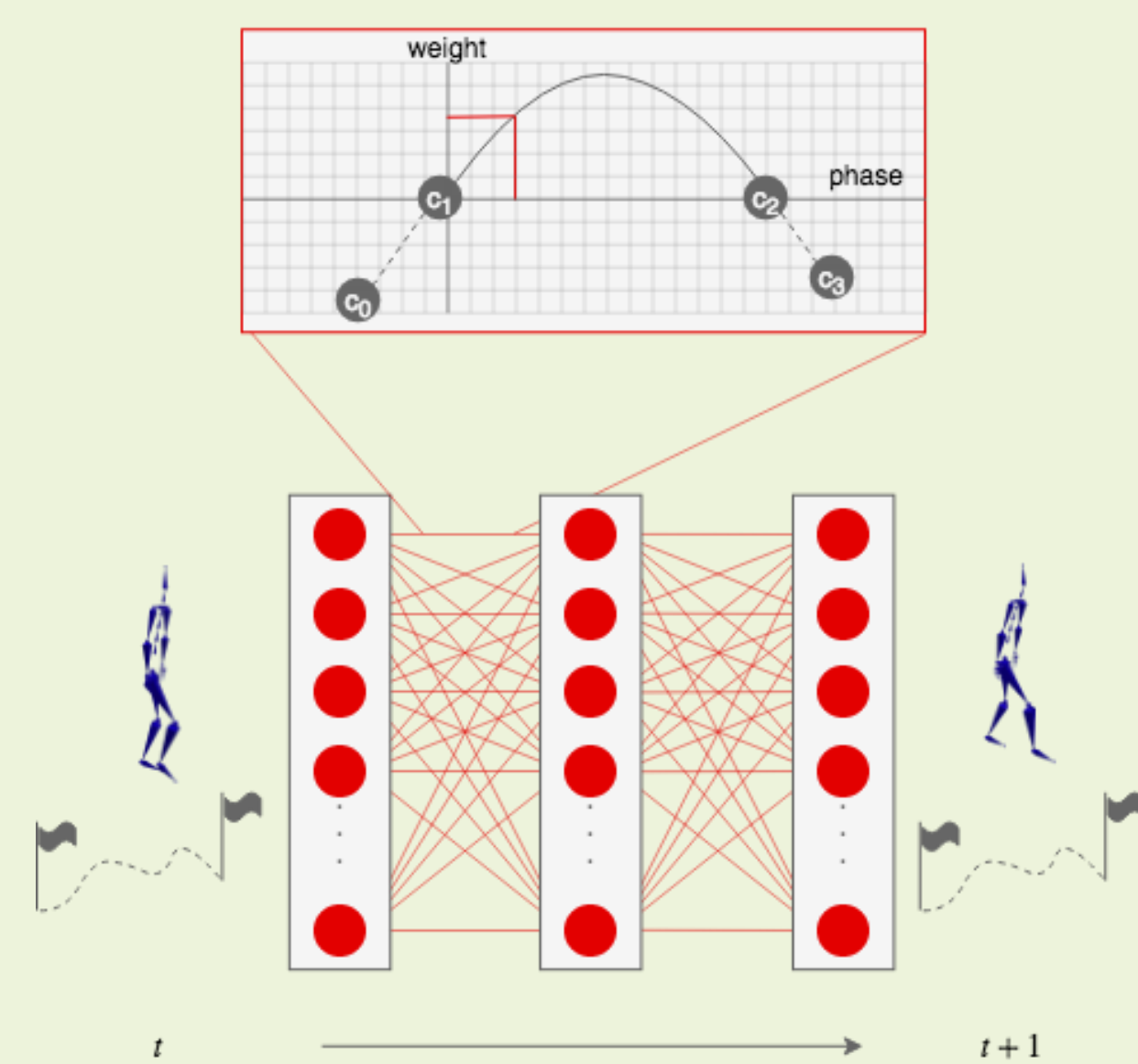
Style Transfer / Stylized Motion Synthesis



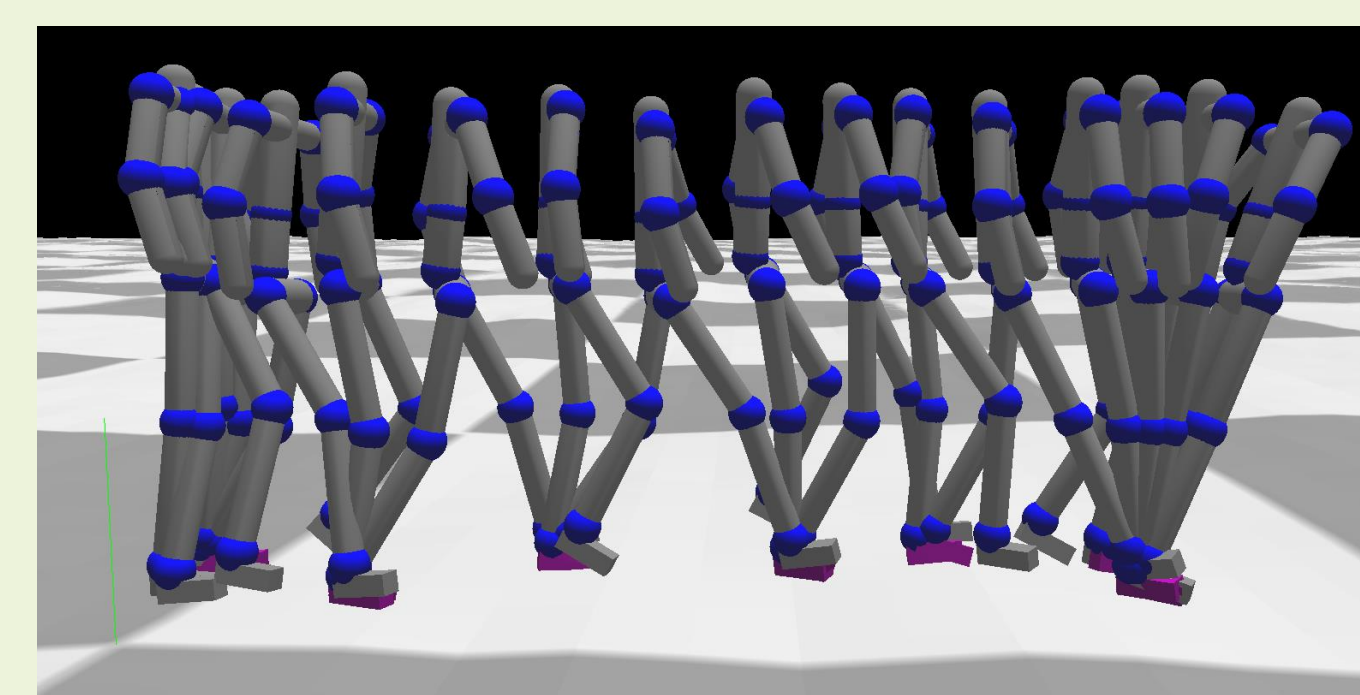
### Behavior Modeling and Sequencing



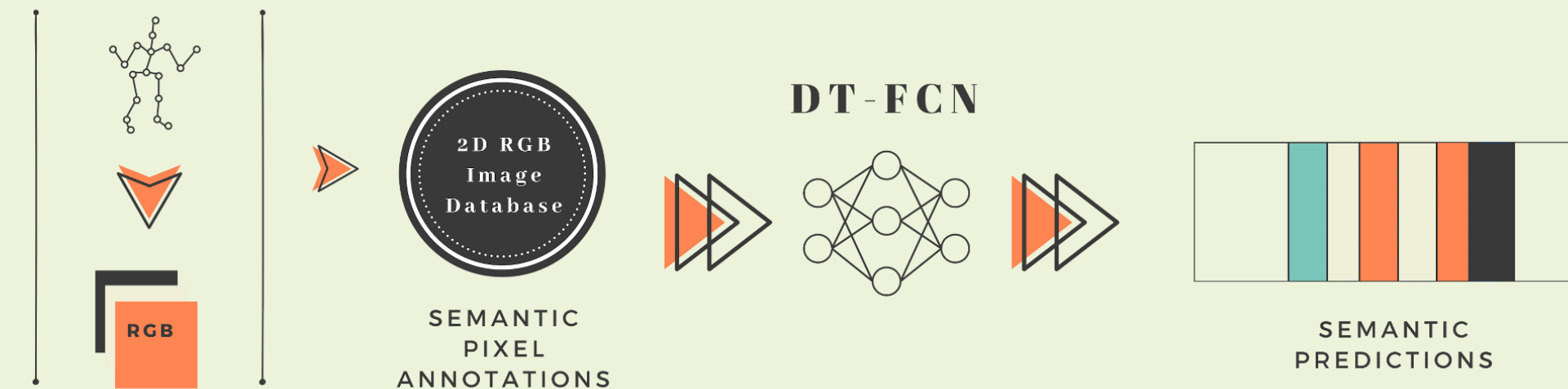
Deep Learning Methods



Physics-based Motion Synthesis



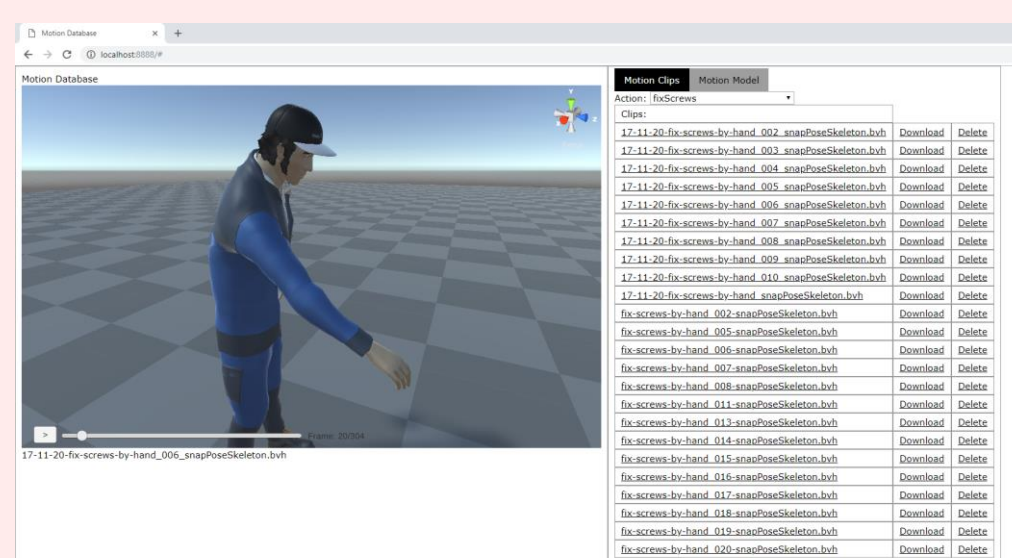
Semantic Segmentation of Motion Capture Data



### Motion Capturing



IMU based



Motion Capture Database

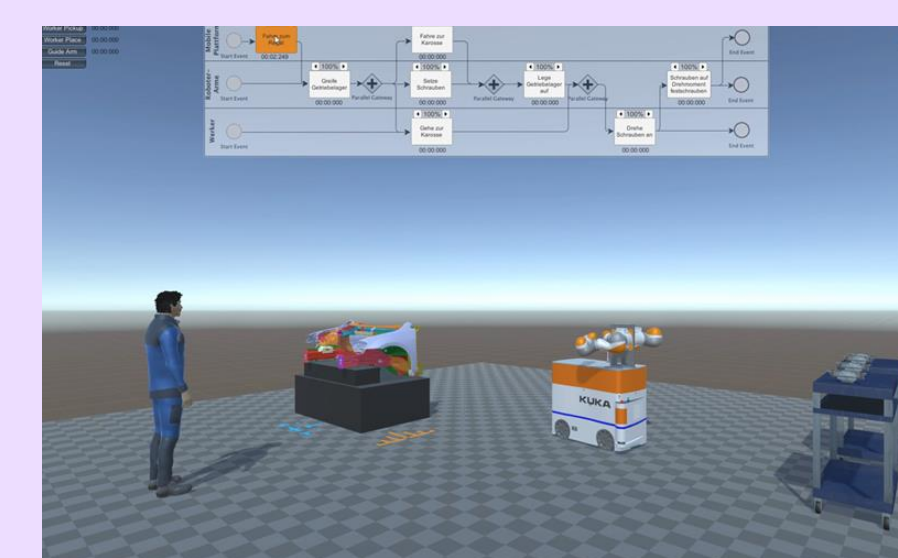
### Application Fields



Pedestrian Simulation



Worker Simulation



Human Robot Collaboration

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15-Nov-18



# ESI SOFTWARE GERMANY GMBH

## COMPANY INFORMATION

- ESI Group is a leading innovator in Virtual Prototyping Software and Services
- 1200 high-level specialists worldwide to address the needs of customers in more than 40 countries
- IC.IDO is one of the industrial grade immersive VR solutions

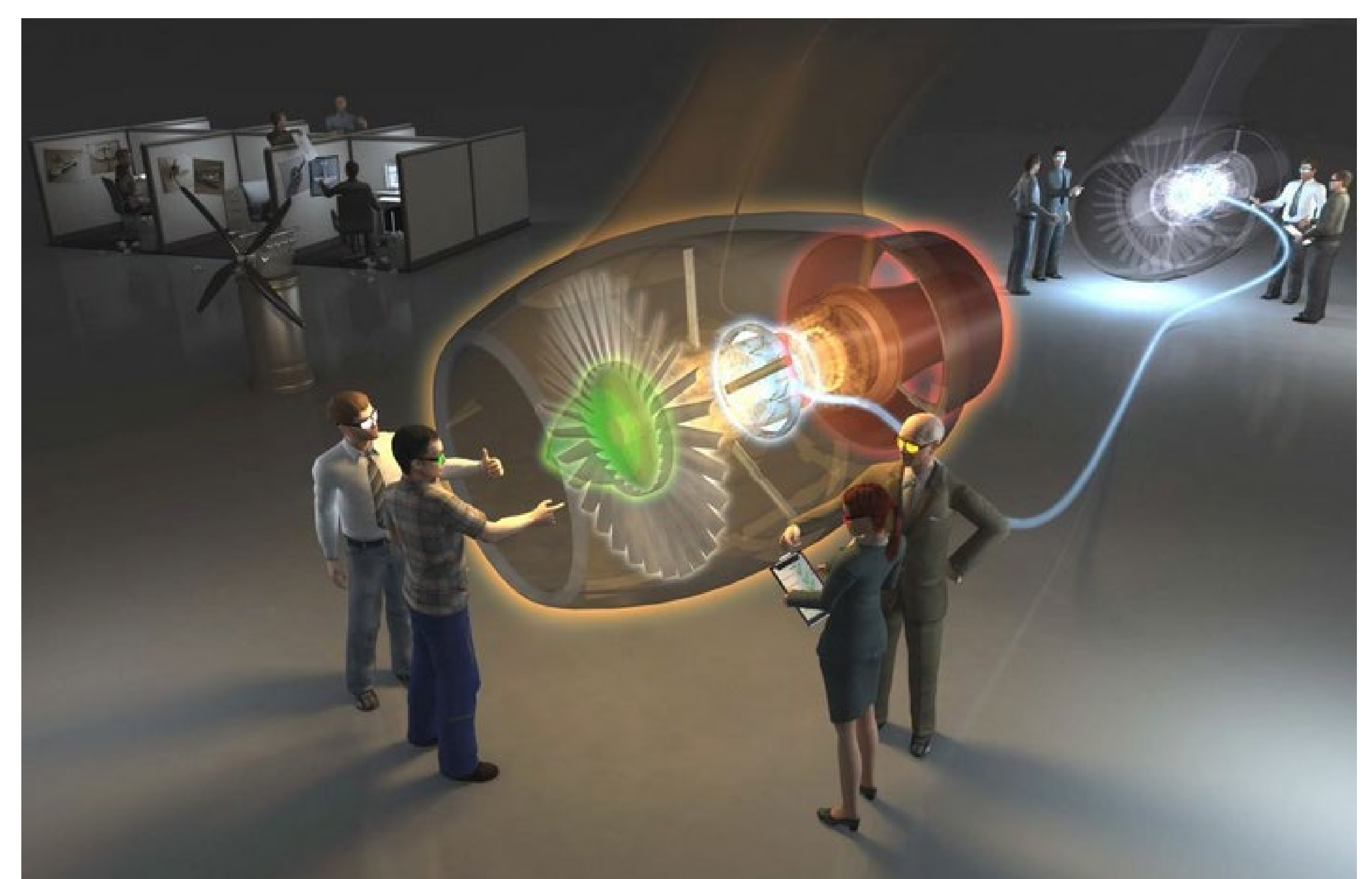


## ROLE IN MOSIM

- Main integrator for final demonstrator solution (car assembly use case)
- Contribution within MOSIM
  - ✓ System-Architecture
  - ✓ Demonstrator Creation & Try-Out
  - ✓ Industry Focus

## PARTNER SPECIFIC INTEREST

Proof-of-concept demonstrator, for a potential enhancement of the human centric functional DMU platform within IC.IDO. Simulating autonomous worker movements is one of the key aspects for reducing preparation efforts for evaluating assembly tasks simulations during planning phases out of worker perspective.

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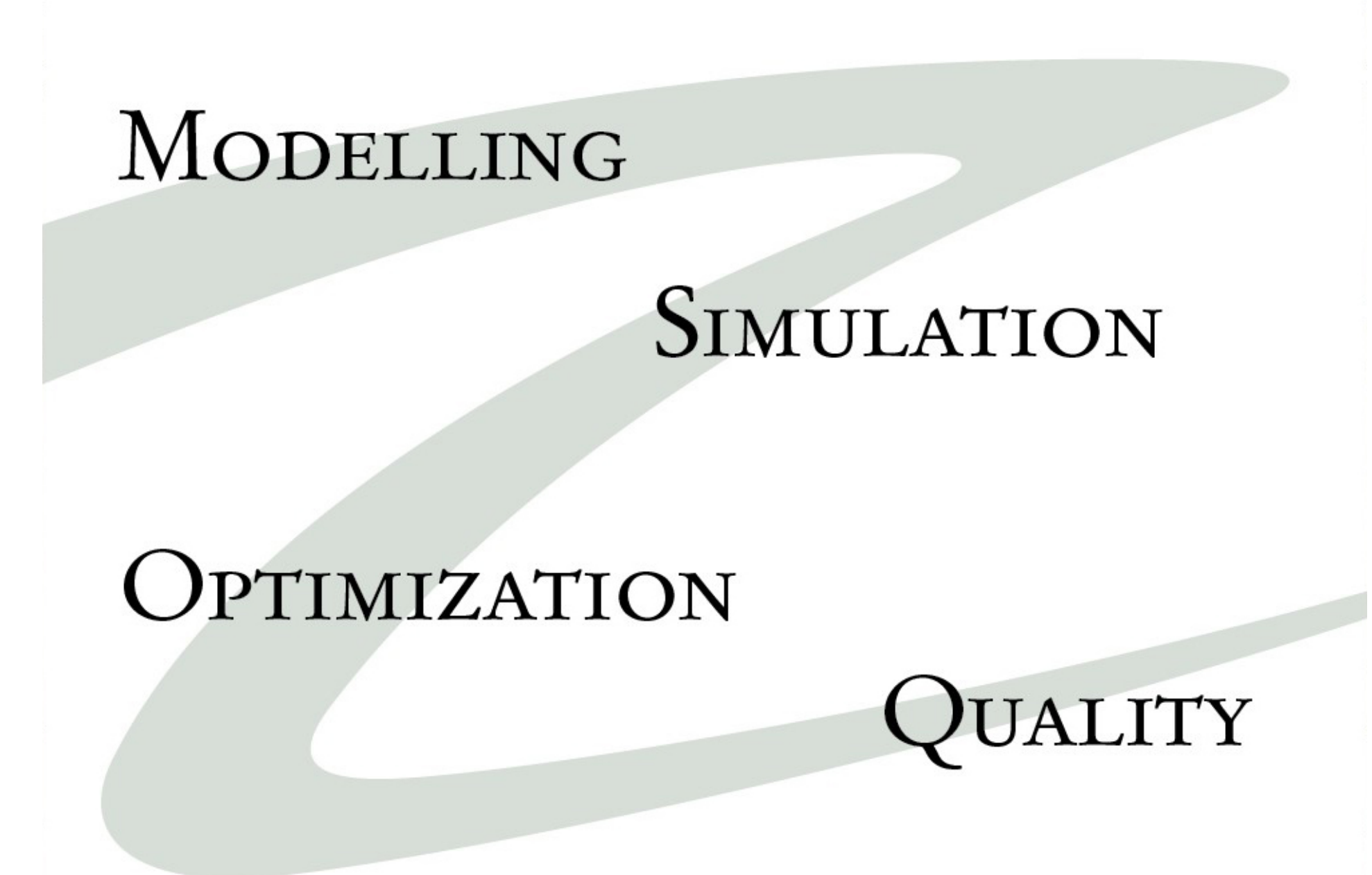
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# Fraunhofer-Chalmers Centre

## INFORMATION

- FCC offers contract research, software and services to improve product and processes based on Modelling, Simulation and Optimization.
- 70 employees, over 500 projects with 200+ partners since the start 2001



## ROLE IN MOSIM

- Position in value chain: Research institute
- Contribution within MOSIM
  - ✓ R&D within Modelling and Simulation for Human Workplace Optimization
  - ✓ Physics-based Human Motions in tight assembly situations
  - ✓ MMU Architecture and Interfaces

## PARTNER SPECIFIC INTEREST

Strengthens FCC as international player in human motion simulation. Blending math based and recorded motions along with standardization formats give new business opportunities.



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19-02-04

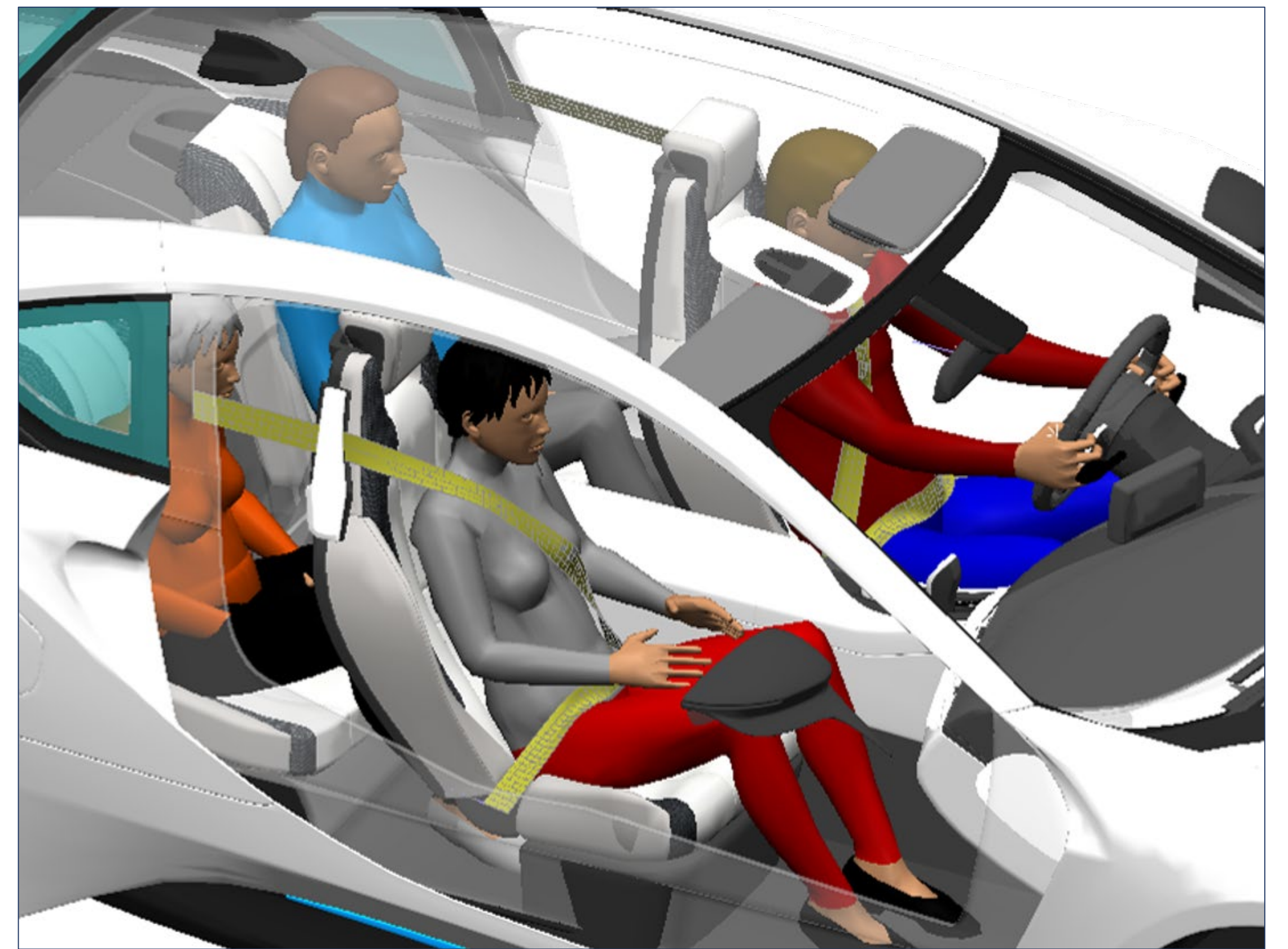




# HUMAN SOLUTIONS GMBH

## COMPANY INFORMATION

- International SME ICT company focusing on human modelling and ergonomic services
- 30 employees in Germany and U.S.
- Innovative software solutions and services for optimal human centered product development

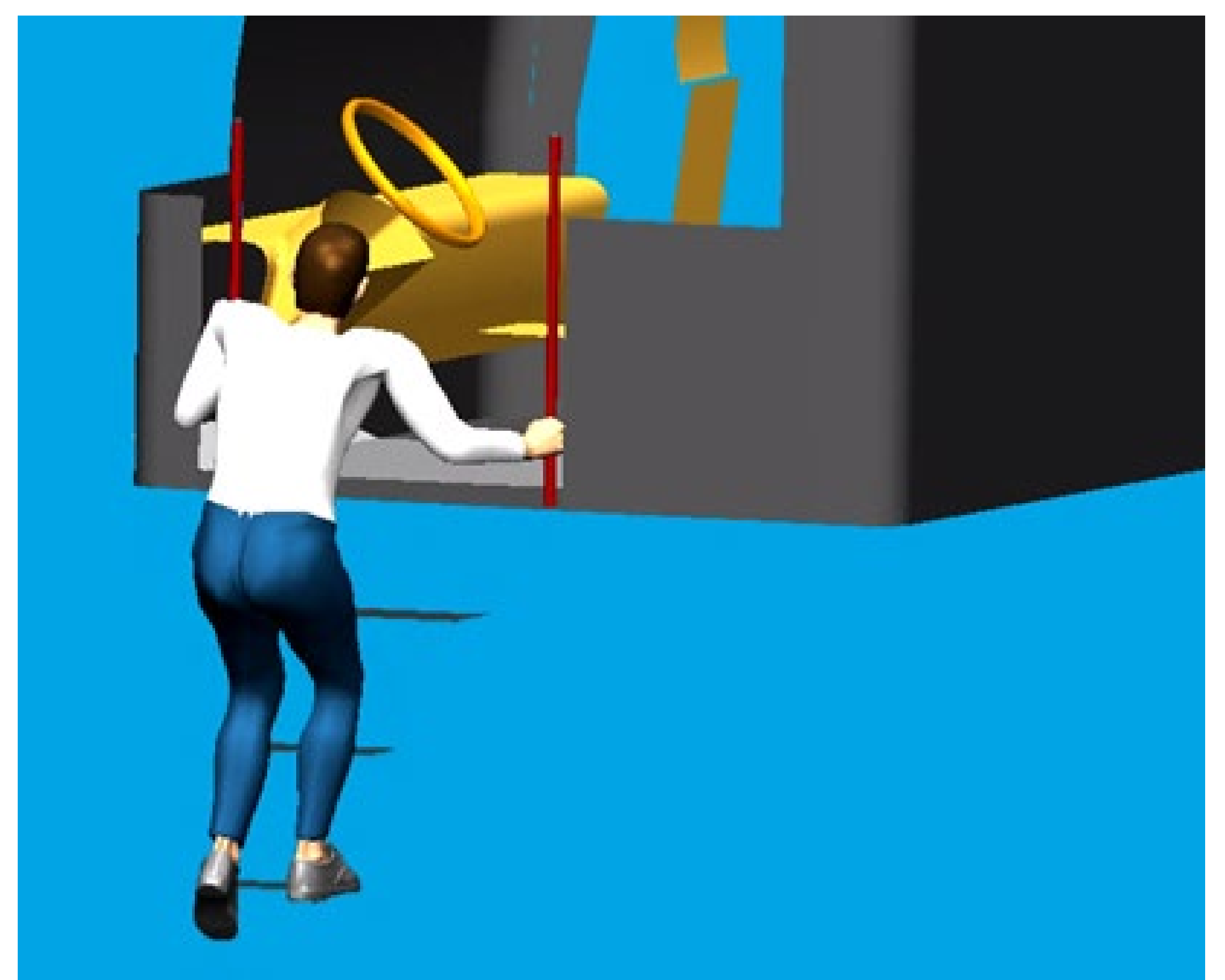


## ROLE IN MOSIM

- Position in value chain: Animation and Technology Provider
- Contribution within MOSIM
  - ✓ MMU architecture and MMI concept
  - ✓ MMU library (car assembly simulation)
  - ✓ Co-simulation

## PARTNER SPECIFIC INTEREST

MMU library and methods extend the application range of ergonomic tool RAMSIS especially in digital production design opening a new target market. In line with innovation strategy to move RAMSIS from a static to a dynamic human model for more realistic ergonomic applications.



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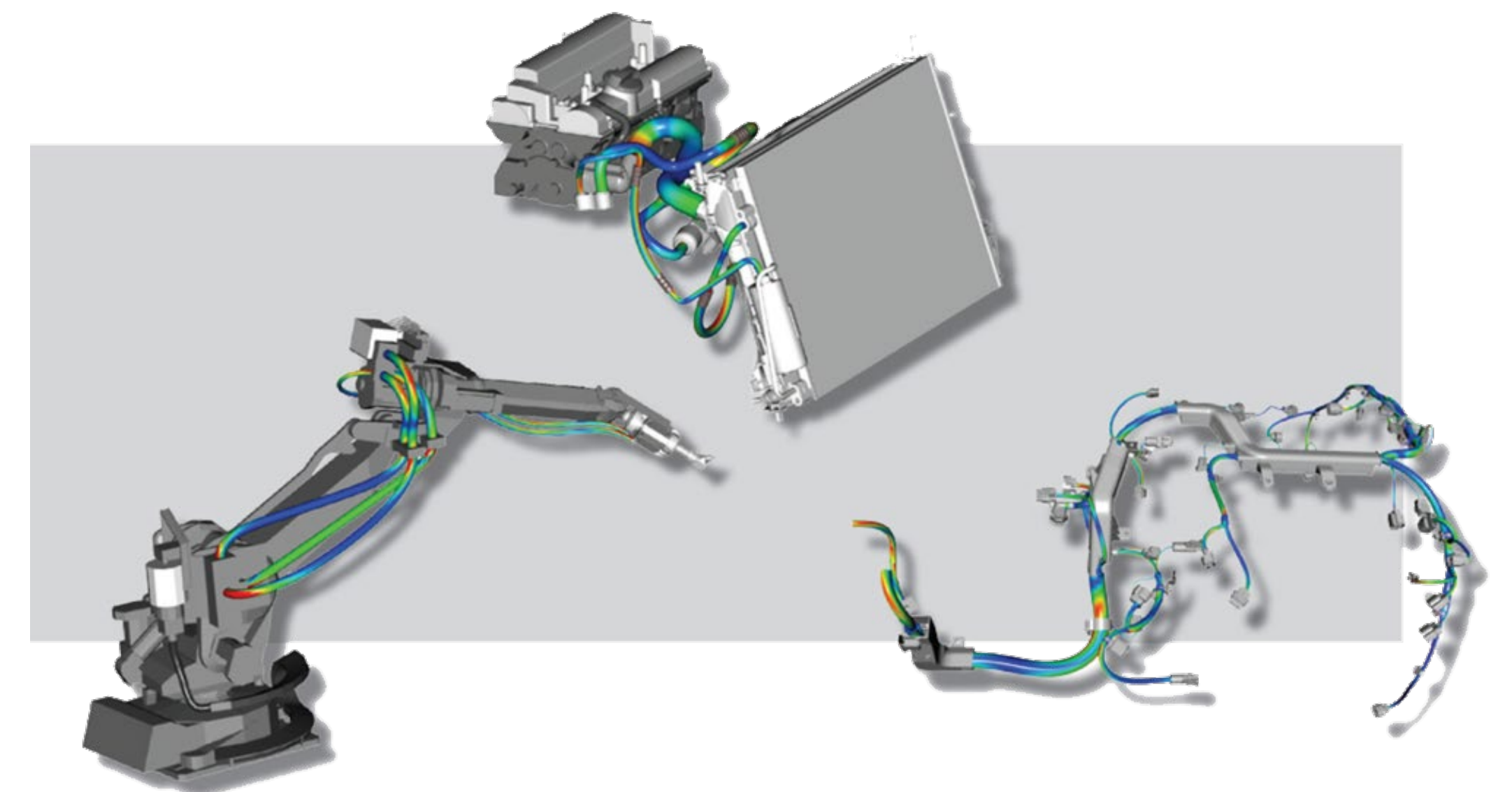
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# Industrial Path Solutions AB

## COMPANY INFORMATION

- Provides a simulation software covering digital human modelling, design of flexible components, assembly path planning, robotics, and simulation of key surface treatment processes
- Around 80 customers globally, mainly in the vehicle and automotive industry



## ROLE IN MOSIM

- Position in value chain: Software vendor
- Contribution within MOSIM
  - ✓ Truck Manufacturing Demonstrator
  - ✓ Workplace Optimization Algorithms
  - ✓ MMU library connected to Digital Human Model IMMA

## PARTNER SPECIFIC INTEREST

To create an IPS software module for human workplace optimization that uses the MMU concept and is connected to Solmes AviX solution. The solution will be marketed to the existing customer base and includes international user conferences, fairs and dissemination through our international reseller network.



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19-02-04



# LUT-University

## UNIVERSITY INFORMATION

- LUT-University was established in 1969. The university campus is situated on the shore of Lake Saimaa – the 4th biggest lake in Europe.
- The university's areas of strength include energy efficiency and energy markets, the strategic management of business and technology, scientific computing and modeling of industrial processes, and expertise in Russian business and industry related to these areas.
- The university has approximately 1000 staff members and about 5000 students attend each year.
- The LUT research team participating in the MOSIM project comprises experts from the SIM Platform, which is developing tools to help enable and promote sustainable product processes through simulation, and experts and innovation management scholars from the university's School of Engineering Science. Together, these members bring an impressive scientific skillset with the research experience needed to both advance simulation technologies and perform quantitative and qualitative solution evaluations in terms of scientific rigor and market feasibility.

## ROLE IN MOSIM

- National Project Management
- Dissemination and Exploitation
- MMU Definition



## PARTNER SPECIFIC INTEREST

Physics-based simulation, Gamification, Simulation & Big Data combination

\*<https://www.lut.fi/sim> or



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19-02-04






# MEVEA OY

## COMPANY INFORMATION

- Mevea is a Finnish high-tech company and one of the leading real-time simulation and digital twin technology providers.
- Mevea's solutions are based on the experiences, software and hardware developed during the last 13 years. The core of the software is Mevea's own physics engine, which accurately simulates the mechanics, hydraulics, power transmission and the operating environment of the machine. Mathematical calculations behind the dynamics are scientifically proven. Our core competencies include:
  - Real-time simulation of multibody dynamics and hydraulics
  - Advanced machine-environment interaction simulation
  - Human-machine interface with real control system
- 20 employees

## ROLE IN MOSIM

- Position in value chain: Software provider
- Contribution within MOSIM
  - Simulation tool provider
  - FMI standard extension
  - MMU implementation
  - Demonstrators verification

		
<b>MEVEA MODELLER</b> Create and edit virtual machine models and environments	<b>MEVEA I/O TOOLBOX</b> Connect all external systems to the simulation:	<b>MEVEA SOLVER</b> Run the simulation in real time using Mevea simulation engine
Design mechanics, hydraulics and powertrain all on the same platform	Machine control and automation systems	View and analyse the results of user-selected parameters
	Simulink® simulation models	Record the simulation for later review and research
	Motion platform and other hardware	

## PARTNER SPECIFIC INTEREST

Digital Twin in cooperation with AI, human modelling



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19-02-04



# m i m i c

## Company Information

- Leading Berlin-based 3D Animation and Motion Capture studio (SME)
- Specialists in animation and motion capture technologies
- Providing services such as Scanning, Modeling, Texturing, Rigging, and many more 3D services



## Role in MOSIM

Position in value chain: 3D Tech-  
and Animation provider / Motion Capture experts

Contribution within MOSIM:

- To provide both animation-based MMUs
- and digital human models.
- To support in defining and developing
- the requirements and the MMU standart
- Research and development of algorithmically
- generated animations

## Partner Specific Interest

The MOSIM project has a high value for the design of human-machine systems. Mimic aims to expand the knowledge of streamlined and algorithmic processes and to get deeper insight into transferring this to its body and facial animation production.



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# RAUTE OYJ

## COMPANY INFORMATION

- Raute is a technology company serving the wood products industry worldwide. Its most important customers are the plywood and LVL industries
  - Approximately 700 employees
  - Raute is the global market leader its largest customer sector, the plywood industry, with a 15 to 20 percent market share. Raute's position in the LVL industry is also strong, as approximately more than a half of the LVL manufactured in the world is produced with machines supplied by Raute



## ROLE IN MOSIM

- Position in value chain: End-use provider company
- Contribution within MOSIM
  - End-use case provider to international / national consortium
  - Demonstrator

## PARTNER SPECIFIC INTEREST

Real-time simulation developers, researchers, and end-users to share knowledge and act as sparring partner along the project. Same thing for VR and AR technologies as well.



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19-02-04



# SCANIA AB

## COMPANY INFORMATION

- Manufacturer of commercial vehicles – trucks and buses, as well as diesel engines for several applications.
- 46.000 employees.
- Production facilities and assembly plants in Europe, Asia, Africa and South America.



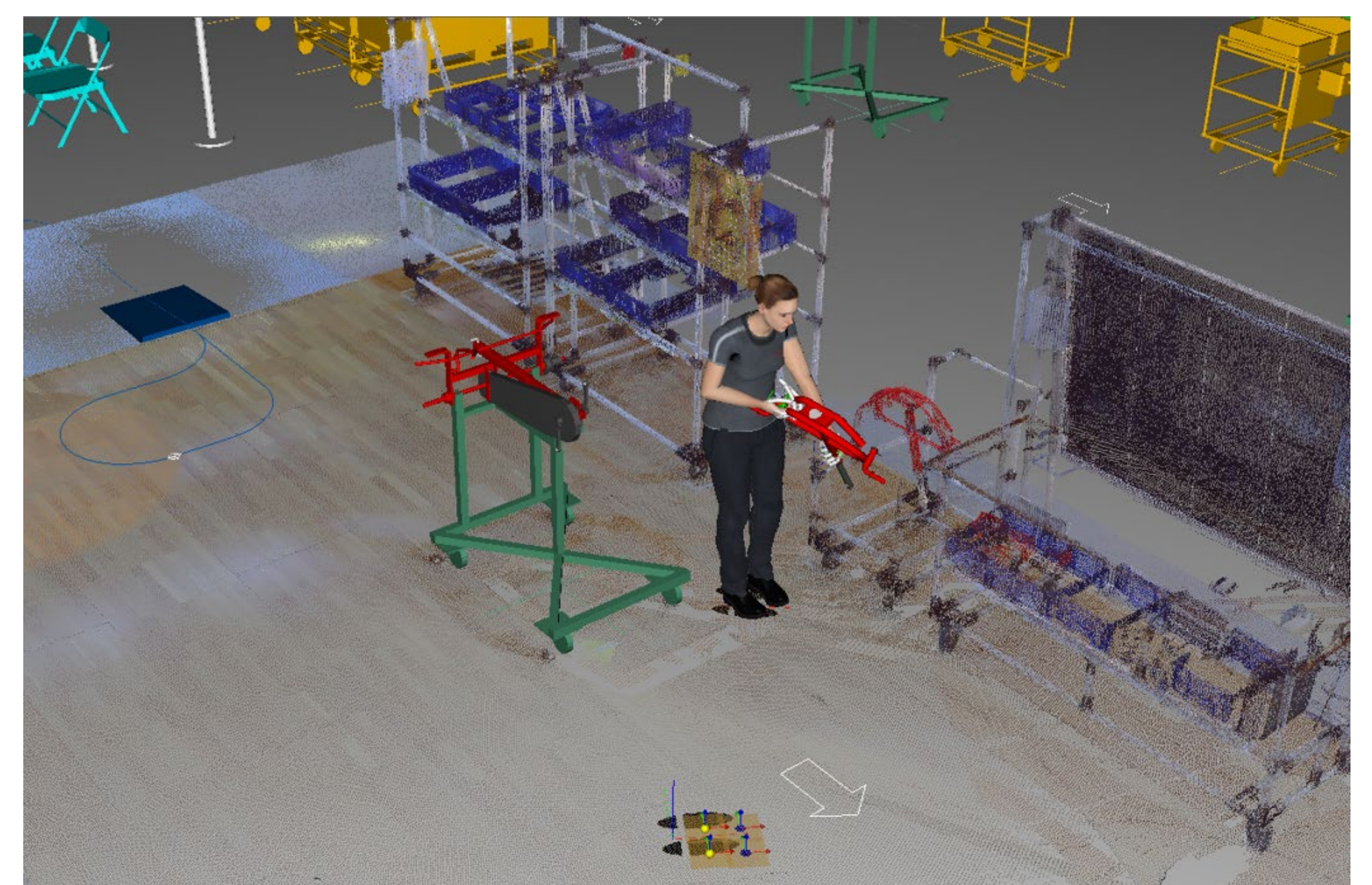
## ROLE IN MOSIM

- Position in value chain: OEM / automotive manufacturer
- Contribution within MOSIM
  - ✓ Use-case coordinator
  - ✓ Demonstrator/Tester/Evaluator



## PARTNER SPECIFIC INTEREST

Development of a simulation tool that enables seamless combination of productivity balancing and ergonomic simulation software, allowing the user to use them efficiently as one single program.



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11/19/2018



# SIGN TIME GMBH

## COMPANY INFORMATION

- Technology leader for animated sign language with avatar technology
- SME with 21 employees
- Based in Vienna / Austria



## ROLE IN MOSIM

- Position in value chain: Animation studio and software developer
- Contribution within MOSIM
  - ✓ Technical requirements and concept for modular simulation framework
  - ✓ Support of the entire development based on our experience with a similar usecase (sign language animation)
  - ✓ Animation of MMUs and creation of MMU sequences



## PARTNER SPECIFIC INTEREST

We want to expand our avatar system for further applications and areas of use. We want to offer simulation and visualization of human movements as a service. We want to produce MMUs for different applications and offer them via the MOSIM platform.

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# TWT GMBH



TWT GmbH  
Science & Innovation

## COMPANY INFORMATION

TWT GmbH Science & Innovation was founded in 1986 in Stuttgart, Germany as an Engineering and IT service provider. Since then the company has grown up to 300 employees at its sites in Munich, Ingolstadt, Friedrichshafen, Berlin and in the region Stuttgart. Today, TWT is one of the leading development partners in the Automotive and Aerospace industries.

## ROLE IN MOSIM

Design of the MMI based on the expertise as one of the co-founders of FMI

Integration of MMUs into a Co-Simulation

Employment of MMUs in the use case Pedestrian Simulation within our real-time physics-based 3D virtual environment Tronis®



## PARTNER SPECIFIC INTEREST

Extension of the FMI standard

3D simulation of pedestrians in traffic scenarios

Integration of MMUs in Tronis® in order to validate sensors and autonomous driving functions with respect to pedestrian detection



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# UNIVERSITY OF SKÖVDE

## UNIVERSITY INFORMATION

- Approx. 7,500 students in 50 undergraduate (BSc) and 10 graduate (MSc/PhD) programmes.
- Approx. 540 employees, of which 330 are teaching staff, and 40 are professors.
- Close collaboration with industries in both education and research.



## ROLE IN MOSIM

- Position in value chain: Research entity, primarily in Swedish consortium
- Contribution within MOSIM
  - ✓ Simulation based multi-objective optimization of ergonomics and productivity
  - ✓ Expertise in optimization, production simulation, digital human modelling and ergonomics
  - ✓ Co-development of proof-of-concept demonstrators, methods and software

## PARTNER SPECIFIC INTEREST

Co-development of software that utilises multi-objective optimization techniques to facilitates planning and assessment of manual assembly in virtual environments and digital twin solutions. Co-development and co-assessment of use cases at cooperating companies to facilitate planning and assessments of manual assembly in virtual environments.



### Contact person:

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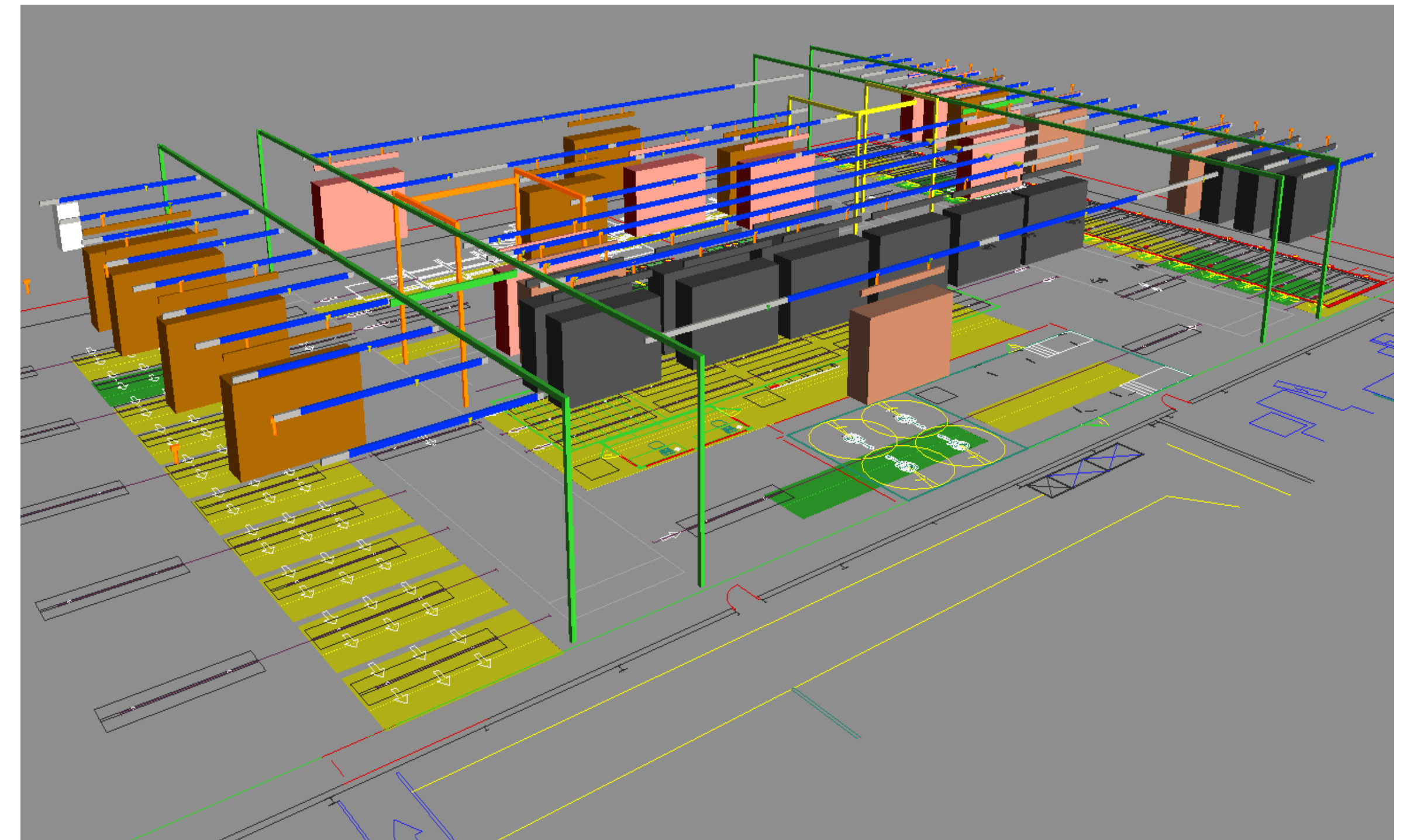
19-02-04



# Virtual manufacturing Sweden AB

## COMPANY INFORMATION

- Supplier of lean-based production and internal logistic development services
- 82 employees in 4 countries
- Years of experience within Workcell – Line design, Method and Balancing to achieve standardize work within automotive industry.
- Years of experience from Simulation and Discrete Event Simulation (DES)

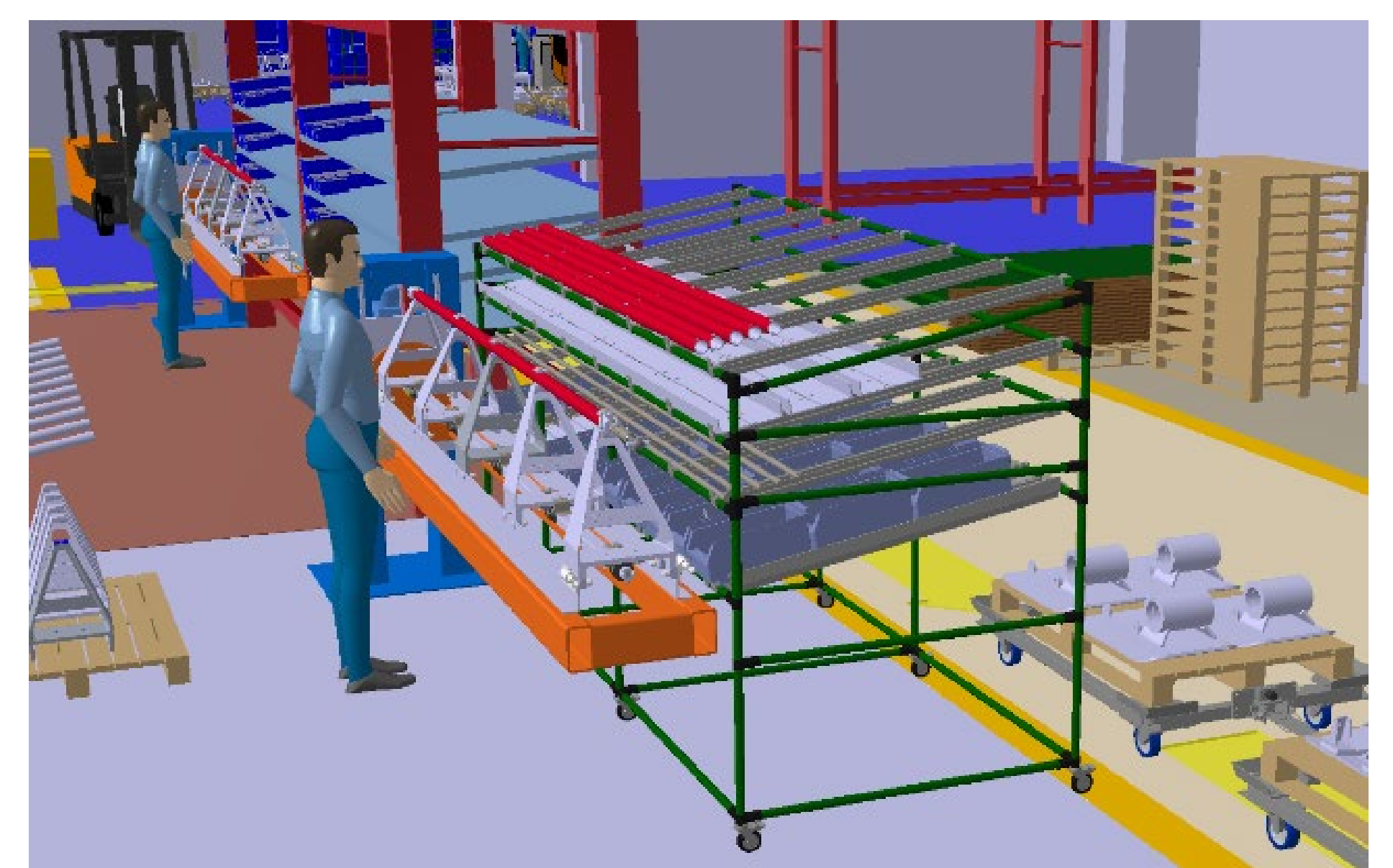


## ROLE IN MOSIM

- Position in value chain: Supplier of services
- Contribution within MOSIM
  - ✓ Use case definition
  - ✓ Requirements and concept for modular simulation framework
  - ✓ Motion generation and demonstrators verification

## PARTNER SPECIFIC INTEREST

A tool for development of sustainable workstations with regards to ergonomics and productivity. This by being involved with the development of the industrial demonstrator within the project and develop the knowledge within the company regarding ergonomics simulation, which can be used for further work.



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**VIRTUAL**  
manufacturing.



# VOLVO TRUCKS CORPORATION

## COMPANY INFORMATION

- One of the world's leading manufacturers of trucks, buses, construction equipment and marine and industrial engines
- ~100 000 employees, thereof 31 000 in operations
- 37 globally distributed production and remanufacturing plants

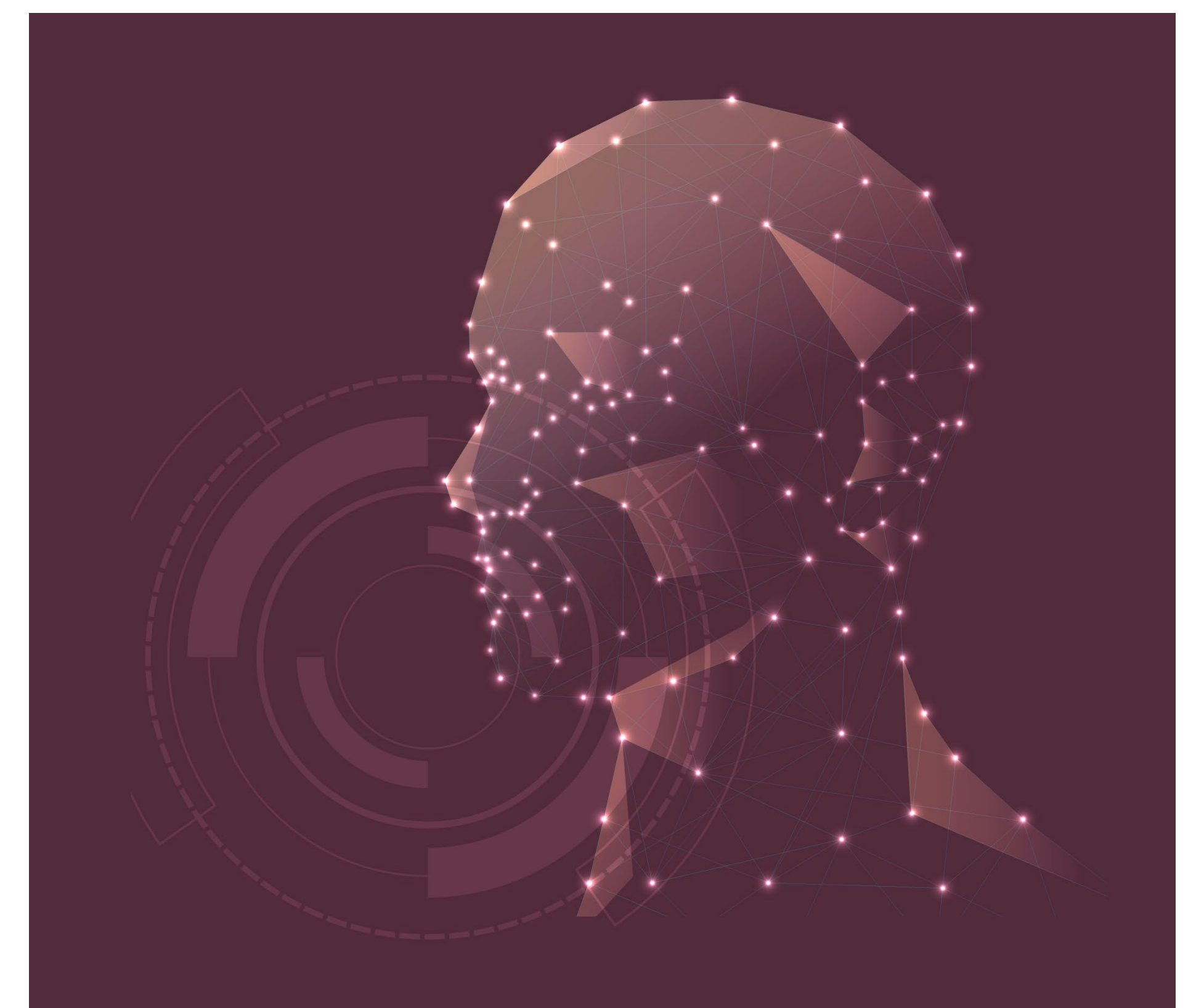


## ROLE IN MOSIM

- Position in value chain: OEM / automotive manufacturer
- Contribution within MOSIM
  - ✓ National consortium coordinator Sweden
  - ✓ Requirements for multi-manikin motion simulation and workplace optimization
  - ✓ Demonstrator

## PARTNER SPECIFIC INTEREST

Demonstrator for one-information chain from motion simulation to assembly decision support. Furthermore, special interest in early process verification where bad ergonomic solutions are avoided and productivity is optimized. The MOSIM approach is one of the corner stones for realizing digital and smart manufacturing.

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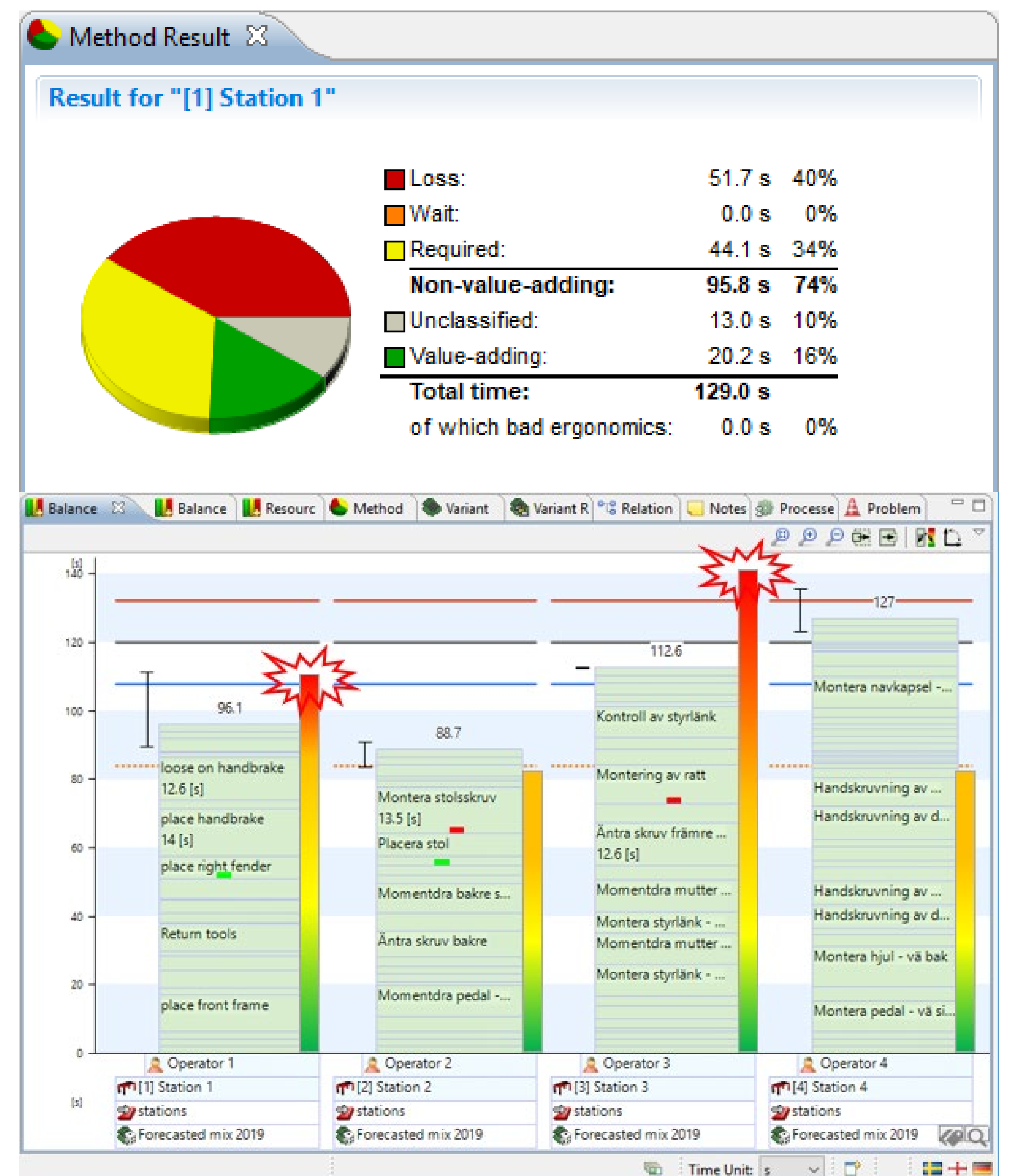
2018-11-27



# Solme AB

## Company Information

- Started as a service company AB 20 years ago – line balancing and machine resetting
- Transformed into a software company over the first years, today only software
  - Process planning, FMEA, Line optimization
  - Supplier to Volvo and Scania – AviX
- Approx. 250 customers in automotive and various industries in +30 countries



## Role in MOSIM

- Position in value chain: software vendor
- Developing integration to Digita Human Model IMMA with the purpose to share assembly sequence
- Developing demonstrator for ergonomic line balancing
- Contribute with experience from complex line balancing

## Partner Specific Interest

- Solme expect to gain knowledge of simulated ergonomic assessment
- Get access to ergonomic assessment and find an approach to norm assessments from different methodologies used in industry
- Overall objective is to provide market with a solution for line optimization from multiple perspectives – assembly time, ergonomic strain, material facade

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