

# SUPCODE

## Supporting Cognitive Decision Making



Pro<sup>2</sup>Future

Belgin Mutlu<sup>1</sup>, Stefanie Lindstaedt<sup>2</sup>, Tobias Schreck<sup>2</sup>, Marc Streit<sup>3</sup>, Josef Küng<sup>3</sup>, Andreas Pichler<sup>4</sup>, Christian Kittl<sup>5</sup>

Pro2Future GmbH<sup>1</sup>, TUG-ISDS/CGV (Institute of Interactive Systems and Data Science & Institute of Computer Graphics and Knowledge Visualisation)<sup>2</sup>,

JKU-ICG/FAW (Institute of Computer Graphics & Institute for Application Oriented Knowledge Processing)<sup>3</sup>, PROFACTOR GmbH<sup>4</sup>, Evolaris next level GmbH<sup>5</sup>

<sup>1</sup> Inffeldgasse 25F, 8010 Graz, Austria

<sup>2</sup> Rechbauerstraße 12, 8010 Graz, Austria

<sup>3</sup> Science Park 3, Altenberger Straße 69, 4040 Linz, Austria

<sup>4</sup> Im Stadtgut Zone A 2, 4407 Steyr, Austria

<sup>5</sup> Hugo-Wolf-Gasse 8/8a, 8010 Graz, Austria



## MOTIVATION & GOALS

**Industry 4.0** as the “fourth industrial revolution”

- fully **automatizes** the **production**
- **optimizes** the **collaboration** of **workers** and **machines**
- Using different helping operators e.g., **decision support assistance systems**

To support **human decision making**, we define the following objectives:

- Combine data-driven approaches, configuration management methods & simulation environments for a **reliable, trustworthy (data) basis** for decision making
- Provide decisions to **humans** considering their **cognitive capabilities**, context and **situation** (e.g., within production process versus design process) in order to ensure timely and optimal decisions.
- Provide a secure connection (**Secure Data Transmission**) to the system

### Project FactBox

**Project Name** SUPCODE  
**Project ID** StratP 3.4.1  
**Duration** 36 Months

**Area 3**  
Cognitive Decision Support

**Project Lead**  
Dr. Belgin Mutlu

## APPROACH

- Define methods for integration of model-based and data-based approaches into a **hybrid system**
- Define methods for **personalize** and **contextualize** decision making for timely and optimal decisions
- Application of data **transmission security** in decision support assistance systems to protect company data
- Definition **visual- and data analytics** methods to support **transparency** in decisions made by decision-support systems

## CONTRIBUTION

### Scientific contribution

- 13 scientific publications
- Scientific collaboration with University of Utah, University of Vienna, FH St. Pölten
- Extensive state-of-the-art analysis on how to analyze interaction provenance data
- Definition of design guidelines for guidance approaches

### Economic contribution

- Secure data transmission of company data
- Open black-box AI for Industry
- New insights about application possibilities of data- visual analytics methods in industrial applications

## OUTCOME

- A data analytics tool which **adapts** the **information space** to what the **user prefers** and **needs**
- **Interactive** data **classification** and **comparison** methods for **high-dimensional data** analysis
- Concepts for user **guidance** in complex visual data exploration applications
- Visual Analytics tools allowing users to statistically confirm **visual patterns**
- A **hybrid approach** which combines **data-driven approaches** with **simulation approaches** to determine the impact of changed configurations on the production systems
- Proposal for a **distributed parallel algorithm** (Distributed PrePostPlus) to utilize the computational power of **multi-core CPUs** used in complex machines
- A **secure data connection** framework

**Contact:** Dr. Belgin Mutlu, Pro2Future GmbH, belgin.mutlu@pro2future.at, +43 316 873 - 9163

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