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MOTIVATION & GOALS

As a result of a large number of product **variants and options**, optimal maintenance and support is **challenging**. To provide a **high quality** of support for all products, it is required to **invest considerable time** by humans involved in all different product stages (testing, maintenance, repair etc.). This is as cost intensive for the manufacturer as it is cumbersome for the worker. This leads to the need of new promising approaches, such as a **Multi-Component Systems (MCS)** perspective toward **predictive maintenance**.

- Cognitive decision support for welding systems
- Data-Driven Predictive Maintenance
- Challenge of high variety of components and options to combine them
- Analysing the interdependencies of variants

Project FactBox

Project Name GuFeSc
Project ID MFP 3.2-1
Duration 39 Months
Area 3
 Cognitive Decision Support
Project Lead
 Dr. Patrick Ofner

APPROACH

Fully data-driven approach which follows four different phases:

- Pre-processing, data exploration, and feature engineering
- Trend Detection, Change Point Detection, Pattern Recognition, and Modelling Interdependencies
- Predictive Model (RUL and Confident interval estimation)
- Model interpretation (xAI)

CONTRIBUTION

Scientific contribution

- "Cognitive Decision Support for Industrial Product Life Cycles: A Position Paper." COGNITIVE 2019
- "Taking complexity into account: A structured literature review on multi-component systems in the context of predictive maintenance," EMCIS 2019.
- "How to deal with missing usage data in defect prediction? A case of a tool supplier in the welding industry", HICSS 2021

Economic contribution

- Improved Finale Test System
- Better products, higher reliability, less costs
- Improved end products performance & usability
- Less costs and better performance of workers (decision support for works)

SYSTEM ARCHITECTURE



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Acknowledgement: This work was supported by Pro²Future (FFG, 854184) and Fronius International GmbH.

