ASP 2 – Adaptive Smart Production 2

Fuel-Cell Components Assembly & High-Speed Bearing System Improvement

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MOTIVATION & GOALS

This project deals with two use-cases, fuel-cell component assembly and high-speed bearing system improvement, and has following goals:

- To develop **innovative fuel cell designs** enabling production cost decrease and performance increase
- To **adapt production line** for high-voltage battery assembly and fuel cell stack assembly
- To **investigate the influence of manufacturing and assembly tolerances** on the bearing system behavior, e.g. noise, vibration, harshness, load-based bearing system temperature and the testbed behavior in general
- To investigate the general conditions and new opportunities to use the **classification algorithms based on image data** in the field of testbed monitoring combined with mechanical measurands.

Project FactBox

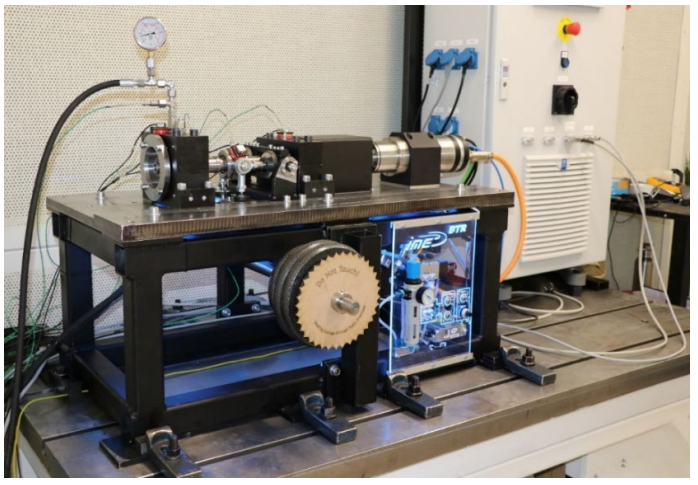
Project Name ASP 2
Project ID MFP II 4.2.3-2
Duration 36 Months

Area_4.2
Cognitive Production Systems

Project Lead
Dr. Markus Brillinger

APPROACH

Developed testbed for investigating the **influence of manufacturing and assembly tolerances** on high-speed bearing system behaviour.



CONTRIBUTION

Scientific contribution
What is the impact in terms of production tolerance to reduce production costs?

Economic contribution
How to optimize fuel cell design for efficient production?
How to adapt existing production lines to follow market uptake?
How far production processes from other domains can be used for fuel cells systems?

OUTCOME / EXPECTED RESULTS

Considering the use-case fuel-cell component assembly, innovative fuel-cell designs (based on design for efficient assembly), which enables a **decrease in production costs** will be developed. Furthermore, a strategy for **production line adaptation** for high-voltage battery assembly, fuel cell assembly, e-motor and fuel-cell can be derived.

Considering the use-case testbed and test procedures for high-speed bearing systems for electric powertrains systems, a beyond state-of-the-art testbed will be developed to investigate the **influence of manufacturing and assembly tolerances** on the bearing system behavior. The generated data assists to optimize the assembly line towards increasing **quality and flexibility**. On the top of that, we will acquire knowledge about the conditions under which classification algorithms based on image data can be used combined with mechanical measurands.

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