

The right software as a booster to make entire wind farms more efficient

PREDIXXION has got the green light: The Federal Ministry of Education and Research approves a research grant for further development. PREDIXXION provides transparency for the operation of wind turbines. The analysis of complex data sets flows into concrete statements on optimised operational management. Artificial Intelligence and Machine Learning pave the way for new ways of developing software.

Büdelndorf, 7 November 2022: Predixxion is the software for analysing the performance of entire wind farms on an individual basis. Data evaluation now goes one step further and will be able to derive concrete recommendations for the operation of wind farms on the basis of a new algorithm. This will eliminate sources of interference and sustainably increase the efficiency of all wind turbines. Wind Service Offshore, the developer of Predixxion, has now received an assurance from the Federal Ministry of Education and Research to promote the research and development of algorithms based on Artificial Intelligence. The aim is to develop a prototype capable of evaluating complex data structures and providing owners and operators of wind turbines with optimised measures for an improved wind farm operation.

"Artificial intelligence is developing in leaps and bounds, and our first step is to harness its capabilities, integrate them and make them available to the wind energy industry," explains Christian Müller, Managing Director of Wind Service Offshore, continuing with a comment on Predixxion's motto: "We avoid surprises with regard to the operation of wind farms." The software uses Artificial Intelligence for data analysis, detects deviations using algorithms, and provides transparency regarding the operating behaviour of wind turbines down to the last detail. Machine learning continuously improves risk predictions. The operating data of a complete wind farm can be compared, trends can be predicted about further improvement of the turbines' performance, and, as a result, recommendations for operation can be derived. This evaluation forms the core of the research project. "After being integrated into the wind farm, we continue to develop Predixxion on a customer-specific basis. The collected data is analysed and interpreted in accordance with the requirements of the operators," reports Müller, regarding its use in practice. Statements about the performance of individual gearbox or rotor bearings, generators or transformers can be retrieved 24/7, as desired, providing detailed answers to the question of where the possible weaknesses of wind turbines lie.

The funding approval gives Wind Service Offshore planning security for the next four years. The research and development work of innovative companies will be spurred by the federal government through the selected funding and will strengthen Germany as an investment location. In making its decision, the Federal Ministry of Education and Research has reiterated the novelty of the project and confirms that Predixxion is the first intelligent algorithm to be implemented and taught in companies for the operation of onshore and offshore wind farms. In contrast to previous monitoring systems, which allowed component damage to be detected, Machine Learning is used to make a statement about the operating behaviour on the basis of the fleet data. Dirk Reinhold, second Managing Director of Wind Service Offshore, emphasises: "Our plans on research and development work go far beyond the level we are now at. The use

of complex data in connection with Artificial Intelligence and Machine Learning for operating onshore and offshore wind farms is still in its infancy. There is currently no application available to provide an evaluation of the operating status on the basis of fleet data. Predixxion is a pioneer on the market and is exploring completely new approaches regarding this combination."

Predixxion is a product of Wind Service Offshore. Its Managing Directors Christian Müller and Dirk Reinhold have been supporting their customers in the operation of wind turbines since it was founded in 2019. When recording technical errors, the engineers noticed that a systematic evaluation of data was not sufficiently possible and that the traditional method of learning from mistakes could not be employed. The idea of developing Predixxion was born. The initial spark came about in November 2021 during the last Wind Energy Days. The response was good and the first wind farm operators have already been using Predixxion's expertise since the beginning of this year. Wind Service Offshore now has six employees. The wind energy experts will be using the 2022 Wind Energy Days to announce the new milestone in the development of Predixxion. From 8 to 10 November, the team will be at Booth 59 in Linstow to inform visitors about the next research steps and the benefits of using modern software.

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