

News: Artificial Intelligence in Interdisciplinary and Group-Wide Applications

PSI Community Industrial Intelligence

In industrial intelligence, PSI deploys software systems that combine the reliability and robustness of industrial process knowledge with the complete range of methods for artificial intelligence (AI). PSI Community Industrial Intelligence (PCII) combines and coordinates all activities in the PSI Group that are related to this important, strategic future topic.

The stability of the solutions is ensured by the industrially tried-and-tested technology and the PSI framework. From a methodical point of view, the existing knowledge covers all topic areas relevant to industry. From applications in artificial neural networks and extended fuzzy logic, through wide-ranging portfolio of multi-criteria and combinatorial optimizations to advanced methods industrial engineering, all methods are in use at numerous big name customers.

Interdisciplinary approach

In total, PSI offers over 50 different AI processes that are continually

maintained and deployed in live production. This forms the basis for methodically developed AI systems that are interdisciplinary in terms of the customer benefits they offer. Not only do they benefit the customer, they also act as the start ramp that is required for the integration of industrial solidity and methodical AI innovation. And this is also the reason why the PSI Group is ahead of many young start-up companies.

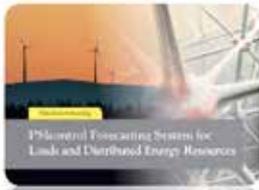
At the same time, the PCII is a driver of innovation. Since its formation in summer 2017, the interdisciplinary spirit of the Community has already produced and piloted over ten new AI

products. All relevant PSI application areas are represented (see figure below).

Complete system scenarios

In addition to these existing applications, PSI has already recognized the future potential in the networking of existing systems to create complete system scenarios. If we connect, for example, the individual systems from the areas automotive, warehouse management, traffic flow optimization, network maintenance, and management of power grids to create networked scenarios, this immediately creates new global system scenarios, for example in the networking of assistance systems for the optimization of production processes, autopilots for decision-making support in the management of energy networks, and solutions for modern mobility, electric mobility, and the networking of production and transport logistics.

- **Concrete examples for AI in industrial applications:**
<https://www.psi.de/en/psi-group/artificial-intelligence/>
- **AI-related methods in PSI industrial solutions**
 - Artificial neural networks
 - Extended Fuzzy Logic Qualicision
 - Deep Qualicision machine learning
 - Cluster learning methods for machine learning
 - Monte Carlo methods
 - Simulated annealing
 - Combinatorial search techniques
- **Application fields for PSI industrial solutions**
 - Transmission and distribution grids
 - Predictive quality in metal industry
 - Optimization of gas transport and energy trading
 - Sequencing in the automotive industry
 - Workforce and asset management
 - Real-time optimization in public transport systems
 - Traffic infrastructure management
 - Supply chain optimization in logistics
 - Luggage recognition at airports



17th Annual Forecasting System for Link and Distributed Energy Resources



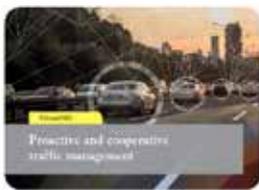
Deep Qualicision Network tool for optimization-driven learning



SoStatt- und Umstapelplanung sichern Qualität und sparen Geld



Predictive Quality for Zero Defect Manufacturing in Metals



Proactive and cooperative traffic management



Use CCTV for object detection

Figure: Application examples of PSI AI industry solutions.



PSI Community Industrial Intelligence working meeting.

To enable innovations to be developed into AI products in the shortest possible timeframe, the Community is made up of working groups, usually comprising three PSI units. These groups work independently but report back on the progress of their work in regular Community meetings, often via video conference. This ensures continual communication across PSI, in which technological issues are clarified across the different disciplines and implemented in AI applications. In this way, the working groups can use the group-wide PJJ platform to develop AI demonstrators that can be rapidly presented to PSI customers.

Trade fairs are an important communication platform in this regard. New AI components have already been successfully demonstrated at this year's E-world and LogiMAT. These will be followed by Hannover Messe 2019 and leading smaller trade fairs such as the Tire Technology Expo 2019.

This means that a range of completely new products or products enhanced with AI from the Community are being introduced in 2019. Some examples include the autopilot for discrete manufacturing, predictive maintenance, predictive quality and the autopilot for support in the management of power grids. In the area of

electromobility, this has given rise to optimization and learning methods for urban and suburban mobility and the balancing of micro grids.

For a comprehensive overview, including articles, reference videos and further information, visit the Community's landing page at:

<https://www.psi.de/en/psi-group/artificial-intelligence/>. 

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PSI



Industrial Intelligence

From April 1–5, 2019 at Hannover Messe trade fair, PSI will present a range of end-to-end software solutions for production, logistics, asset management and service management with a focus on AI applications.

We look forward to welcoming you in Hall 7, Stand A24.

