ConWearDi

Internet of Things at the digitalized building site

An intelligent drone documents the construction progress. Source: DFKI

enoba
smart construction

Spin-off project ENOBA integrates intelligent sensors for recording construction vehicle activity data. Source: ENOBA

The construction industry has a lot of catching up to do when it comes to digitization: While BIM systems (Building Information Modeling) and modelling and simulation tools are already being used in construction planning, construction, i.e. the concrete value-adding work on the construction site with its trades, has so far been dominated by analog media and processes.

This is where the ConWearDi project, funded by the Federal Ministry of Education and Research (BMBF), comes in: Innovative, technology-based services driven by digital construction site processes will be developed in the project. The project will link different value chains in the construction industry.

The exhibit of the Embedded Intelligence department presents ways in which automated condition monitoring, remote management, and predictive maintenance may be implemented at a construction site. Intelligent networked sensors in construction materials, in the vicinity of the building site, or in the machines support the deployed AI systems.

Using Industrie 4.0 technology, the project will develop a web-based platform that enables a digital information exchange between all involved in the construction process as well as intelligent planning and control services in addition to continuous quality assurance and documentation processes. If implementation is successful, it will be possible in the future, to use real-time construction data for intelligent, on site monitoring and control of the process flow.

The specific applications shown at the exhibit were developed in close collaboration with our partners in ConWearDi, for example, the detection of wear on attachments and material consumption at the tooling machines, or documentation of processes through activity detection. The system assists the local operator via context-relevant usage instructions and automated, optimal settings for the machines. Intelligent algorithms for long term analyses of automated internal temperature and humidity measurements of the building materials provide useful support for energy management and enable anomaly detection to identify possible construction deficiencies and predictions about the condition of an object.

Furthermore, practical findings from the "Enoba - Smart Construction" project funded by EIT Digital are demonstrated along with advance developments achieved at the spin-off company of the same name. These include innovative, AI-driven services for construction and building trades and digitalization support across the entire value chain. The exhibit shows a system that records the activities of construction vehicles with integrated optimization of resources and routes.

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CONSTRUCTION WEARABLES DIGITIZATION

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