

Cognitive Material Diagnostics project group

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Data is becoming the key factor for new ways to create value in plants, products, and processes. With the help of artificial intelligence (AI) and machine learning (ML), even large amounts of data can be effectively analyzed and thus made usable.

The Cognitive Material Diagnostics project group (KogMat[®]) develops and applies the latest approaches in AI and ML to a wide range of applications. Since 2019, it has been located directly at BTU Cottbus-Senftenberg and is funded by the State of Brandenburg and the Fraunhofer-Gesellschaft. A broad spectrum of applications can be tapped by working with numerous companies in the region, BTU chairs, national and international universities, and clinics. Applications range from the quality assessment of manufactured components and predictive maintenance of industrial equipment and wear components to processing spoken and written language and analyzing biological and medical data.

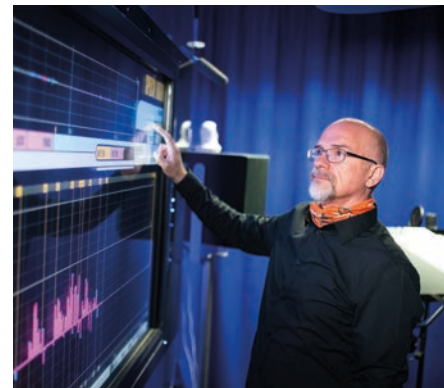
Since the start of the project, we have already succeeded in acquiring third-party funding of more than 1.2 million €. The establishment of research activities in Lusatia is intended to create new qualified and forward-looking jobs in the fields of cognitive materials, machine learning and artificial intelligence in this mining region.

In the joint project "Data-based services", for example, Fraunhofer IKTS is working with ABB AG, Lausitz Energie Bergbau AG and EWG Automation Cottbus to preserve the extensive knowledge of conveyor belt systems in open-cast mining. Artificial intelligence will be used to secure the expertise that will be applied in a targeted manner to restructure the companies affected by the undergoing structural change

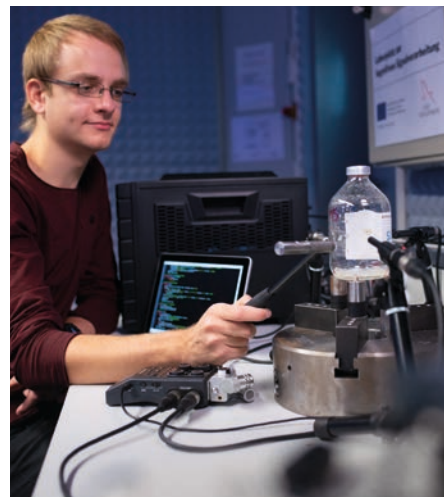
in the Lusatia region and make the expertise available to other companies. This ensures that these competencies will not be lost in the upcoming coal phase-out.

In a further joint project named "Digital twins for process optimization and predictive maintenance", the project partners are developing a system for planning and optimizing operating modes and maintenance measures in industrial plants and outside the power plant sector. The KogMat[®] project group is also making valuable use of its expertise in the areas of pattern recognition and data analysis in the joint project "Intelligent information processing". Here we are working on methods and algorithms for modeling continuous industrial processes, analyzing large data sets and making them usable for optimizing and increasing the efficiency of industrial processes.

In addition to R&D cooperation projects with companies and research institutions, KogMat[®] offers feasibility studies, scientific consulting as well as data analysis and evaluation. Furthermore, the range of services includes the construction of hardware modules for portable, flexible data acquisition, the development of detection and training software for pattern recognition, among other things, as well as the combination of hardware and software for constructing customer-specific in-line- and offline-capable testing systems.



Test site for cognitive systems at BTU Cottbus-Senftenberg.



Test set-up for the inspection of cracks in glass bottles.

