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FRAUNHOFER INSTITUTE FOR TECHNOLOGICAL TREND ANALYSIS INT

PRESS RELEASE

Using ‚Cognitive Computing' for Scientific Research

Fraunhofer INT (Institute for Technological Trend Analysis) receives EUR 1.2 M for the development of faster and more efficient methods of innovation research

Euskirchen (Germany) - The Fraunhofer Project KATI receives a grant in the amount of EUR 1.2 M from the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) for a project term of three years. KATI is conducted at the Fraunhofer Institute for Technological Trend Analysis in Euskirchen (Germany). The objective of the research project is the development of an IT and data-based system to assist researchers in compiling their technology analysis.

The project name KATI is an acronym for Knowledge Analytics for Technology & Innovation. Project KATI builds on the expertise of researchers working in the INTs TASP department (Technology Analyses and Strategic Planning). They are particularly versed in technology foresight and technology analysis. Another essential project requirement of the project is the use of methods for quantitative innovation prognoses and innovation visualization, which have been developed at Fraunhofer INT in recent years.

In the ongoing project KATI, the group develops a support and assistence system for scientists working in technology foresight. The system will make their work faster and more productive. Initially, this will apply mostly to performing literature research. One of the intended benefits of the system is a drastic reduction in the time required for identifying relevant publications. This will give the researchers more time to deal with the subject matter. Additionally, the system will support the work of researchers by automating and speeding up the analyses, which are still time-consuming today. Eventually, the system will be able to perform novel types of analyses which are currently being developed as part of the project.

For more than 4 decades, the German Ministry of Defense relies on the research and analyses of the Fraunhofer INT for its long-term research planning and most importantly for its strategic technology foresight and evaluation. The achieved increases in the speed, expansion and efficiency of innovation studies at the Fraunhofer INT will also have a positive effect on the planning processes in the Ministry of Defense and other public principals.

‚Cognitive Computing' for the strategic technology foresight

‚Cognitive computing' will be part of the complete KATI system. This type of computing encircles attempts to use software to mimic human cognition, i.e. the faculty of the brain to recognize and understand. In this computational endeavor, scientists use

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various technologies. Procedures known in natural language processing, are required to access and analyze the meaning of text. Algorithms from data mining, machine learning and from turning Big Data into insights will complement natural language processing. Using these capabilities, the researchers will cluster heaps of text, recognize patterns in the text and classify these patterns as well as deviations from the patterns (known as anomalies).

As early as in late 2015 and in the context of a preliminary study, the KATI Group was able to acquire the market-leading software tool in this field and integrate it into the Fraunhofer INT IT structure. Right now, the computer linguistics and machine learning components become part of the arsenal used by the institute's researchers. The Fraunhofer INT faces a very specific challenge, which arises from the need to cover more than one scientific discipline. Instead, the researchers must continuously observe the entire spectrum of developments in technology and the natural sciences. To meet the requirements of strategic technology foresight, they must custom-engineer the tool.

Reaping the entire range of benefits of the new assisting system at the Fraunhofer INT is still many working hours away. Project managers Dr. René Bantes and Dr. Marcus John anticipate finishing the first demonstration server with included machine learning capability no earlier than in 2018. Dr. Markus John specifies: „Right now, the most important work package is customizing the software to meet the requirements of the Fraunhofer INT and the strategic technology foresight aspects. Initially, we want to develop a system with comprehensive analytical options. Only after completing this part of the project can we begin to give the application learning capabilities". With assistance from the Fraunhofer INT central IT services, an alpha release version of the system was implemented at the end of 2016. Currently, the group tests this version and adds advanced features. Meanwhile, the system already harbors more than 50,000,000 bibliographic data sets with information on scientific publications for use in research and analytical work.

Investment in the Future of the Fraunhofer INT

The project owes its existence to an initiative of Institute Director Professor Michael Lauster. In more ways than one, the project may contribute to the secure future of the Fraunhofer INT. The advanced new research and analytical capabilities will also expand our ability to provide information and act as consultants. This will help the Fraunhofer INT to stay ahead of the competition. The project budget also contains funds for doctoral theses. The scope and complexity of the project suggest many topics, which could reasonably be considered the subject of scientific theses. Moreover, assigning doctoral theses will strengthen the relationship of Fraunhofer INT with academic institutions.

The Fraunhofer INT offers science-based analysis and assessment capabilities across the entire technical development spectrum. In-house expert analyses and prognoses in select fields of technology as well as theoretical and experimental work in the fields of electromagnetic and nuclear effects will flesh out this summary.

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