

Graz, 20. April 2021

Smart quality control for conductor plate industry

- **Artificial intelligence is successfully conquering the conductor plate industry**
- **Automated image recognition and analysis are stepping stones for cost reduction in terms of quality control and resources.**
- **Explainable AI takes aim at strengthening trust and acceptance of smart systems**

Conductor plates are known as the nervous system of any electronic device. No matter if it is about mobile end devices or the automotive, industrial and medical sectors. The areas of application are diverse, as is their production. A single conductor plate requires around 150 complex steps until it is ready for use.

Quality control made possible at highest level

"At AT&S high quality is a given when it comes to our products. Conductor plate images are taken automatically during the process of manufacturing and subsequently pass through image analysis software. Sometimes conductor plates are falsely identified "defective". Regrettably for us, without any comprehensible reasons. This may result in additional loss of time and resources." Ulrike Klein states, Head of Data & Analytics at AT&S.

Know Center developed an AI-algorithm for AT&S, its project partner and leading manufacturer of high-end conductor plates. This algorithm not only identifies images of conductor plates properly, but in addition provides an explanation as to why a conductor plate has been identified defective or intact. AT&S consequently owns a transparent AI system, which will deliver comprehensible and explainable results in the foreseeable future once intensively tested.

Technicians and AI consent

"Our goal was to precisely detect faulty PCBs and make the results traceable. We are pleased we succeeded by implementing the project and our results also agreed with the propositions made by AT&S's technicians," Dr. Andreas Trügler states, Head of Research, module DDAI, at Know-Center, and further explains: "First, our algorithm had to understand which PCBs were faulty and why. In order to achieve this, a neural network was trained and supplied with image data of correct and faulty conductor plates by our team. By using methods from the Explainable AI research field, we were able to provide additional explanation in terms of why and where a PCB was identified as faulty."

Smart production environment using AI

Industry 4.0 or so-called "Smart Factory" no longer is a dream. The insert of smart machines and applications provides companies with significant advantages in times of increasingly competitive pressure.

Now more than ever AI is the driving technology for innovative products and services in the digital age. This fact primarily has become noticeable for the manufacturing industry in the field of automation. Stefanie Lindstaedt, Managing Director at Know-Center explains: "AI enables quality assurance at the

highest level and thereby helps organisations save costs and resources. However, quality gaps still exist when it comes to automated image recognition and analysis, which keeps advancing on various sectors of the industry. Building trust in these technologies proved to be another obstacle on the path to firmly embedding AI within organizations. We are very pleased this project has succeeded by overcoming both."

AT&S Austria Technologie & Systemtechnik AG, is one of Know Center's industrial partners joint by the module DDAI which runs under the auspices of COMET. The module, which is led by Know-Center and funded by FFG, aims to develop safe, verifiable and explainable AI which assures privacy protection simultaneously. It will significantly contribute to acceptance and trust in AI. In the future more projects leading to "trustworthy AI" will be promoted collectively by AT&S and other industry partners which are part of the module.

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About Know-Center

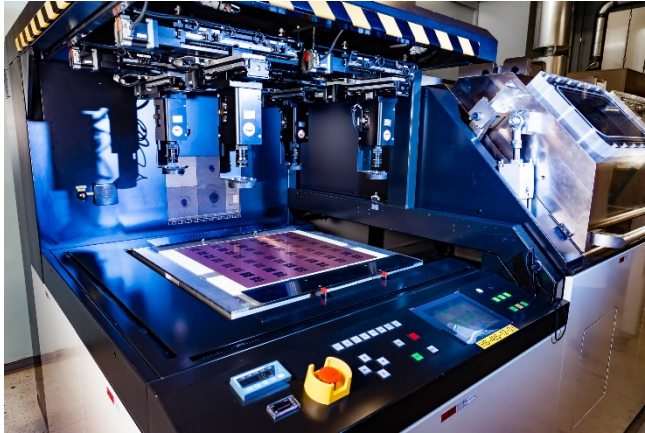
Know-Center is one of the leading European research centers for Data-driven business and AI. It has been supporting well-known companies by using data as a factor of success for their businesses since 2001. Know-Center relies on established Big Data as well as High Performance Computing (HPC) infrastructure for data analysis. Known as constant part of the European research landscape, the center very successfully processed numerous projects and contract research on an European as well as domestic level. The K1 Competence Center, which is funded within the framework of COMET, is the leading training center for data scientists in Austria and in addition offers a range of AI training and consulting services to companies. The majority shareholder is Graz University of Technology, a key supporter of domestic AI research, whose institutes process numerous projects together with Know-Center. In 2020, Know-Center was the only Austrian center to receive the EU's iSpace Gold Award, which only has been awarded nine times in the entire EU so far.

Further Information: www.know-center.at

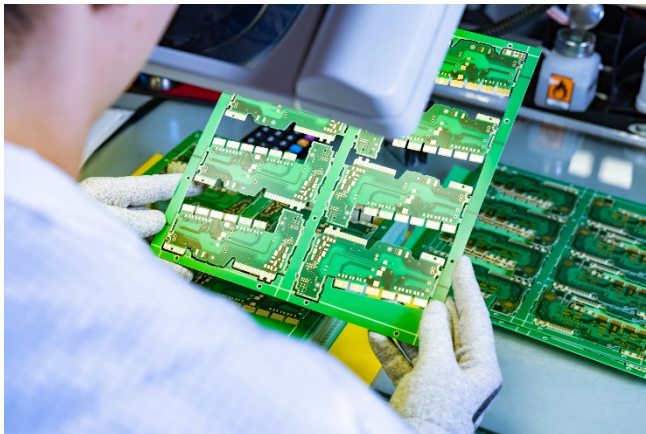
About AT&S

AT&S is one of the world's leading manufacturers of high-quality conductor plates and IC substrates. AT&S industrializes trendsetting technologies for its core businesses mobile devices, automotive, industry, medicine and advanced packaging. AT&S, an international high-growth company commands a global presence, with production sites in Austria (Leoben, Fehring) and plants in India (Nanjangud), China (Shanghai, Chongqing) and Korea (Ansan near Seoul).

Gallery



Pic 1: Automated photographing of the printed conductor plates ©AT&S



Pic 2: Conductor plates under the microscope ©AT&S