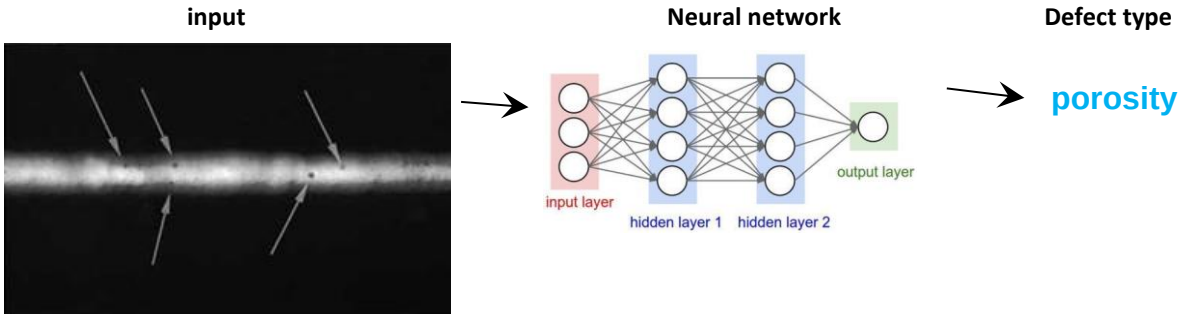
Automated quality control

Inspection of quality of products and components is one of the most important processes in most manufacturing companies. When done in a non-automated way, it requires vast capacities of specialized labor. Especially if it's necessary to inspect every product produced in the plants. High utilization of the specialists then translates to more human error, low reliability of the process and negative impact on the quality of production.

Efforts to automate the quality control with traditional methods of automation suffer from rigidity and low reliability. Thanks to the neural networks (an approach of artificial intelligence), it is possible to remove the tiring and repetitive tasks and make the process automated and more reliable.

Some quality inspection methods we work with

- visual testing
- magnetic particle inspection
- radiographic testing
- ultrasound testing
- penetrant testing



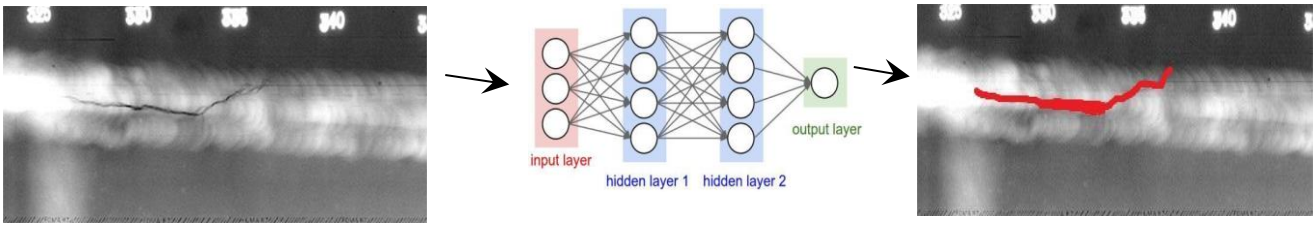
Automation of quality inspection using neural networks

Our solution is a software – robotic assistant – that collaborates with the customer's specialists and can be integrated into the existing infrastructure and processes. Some benefits of having such system are:

- archiving of inspection records of all products
- elimination of routine work, time savings
- increase of reliability of the process
- faster identification of defects

The system analyzes various data (records from defectoscope, parameters of production process, temperature, …) and automatically identifies the defected products or components. Thanks to the powerful technology, it:

- copes with high variability of inputs (rotation, deformation, various products)
- easily adapts to changing environment and new conditions
- can continually improve (learn)



Why Cognexa

Most of our toolkits are specialized for working with digital signals, such as image and video. That enables us to deliver neural network solutions for quality inspection automation in a fast and convenient way. Cognexa is a world class in image and video processing, what is proved by our references:

- **Automated assessment of quality of embryos** - the most accurate solution for automation of inspection of viability of a human embryo for in vitro fertilization (video)
- **IsletNet** – the most accurate solution for identification and analysis of Langerhans islets (photo)
- **ID OCR** – probably the most accurate system for digitization of ID cards, driving licenses, passports, etc.
- **Meter-reader** – highly accurate automation solution for visual reading of utility consumption meters. One of the first mobile offline applications of neural networks in the CEE region
- **URL class** – technologically unique replication of a client's system, which delivers significantly better results

Partnership with ATG

Our expert partner for quality inspection is ATG, a company that delivers defectoscopes and complex solutions for quality control to manufacturing concerns all over the world. Together we can deliver production-ready solutions which may include the purchase, installing and integration of cameras, probes and other quality inspection appliances into the production lines and systems.

Example: Visual testing of bearings

Renowned concern produces metal bearings of numerous sizes and shapes. The company has high quality standards and visual testing for surface defects is performed by tens of employees in each factory. Despite the company-wide efforts, the error rate of the inspection is not negligible.

The company experts estimate, that the investment into rebuilding of production lines and deployment of a neural-network-based quality inspection automation solution will pay back in less than two years solely on lower labor costs. Archiving of testing records for every single product and increased reliability of the whole process will bring further savings, as well as a strategic advance in the highly competitive market environment. Higher margins will finally enable the company to build a new production hall and create hundreds of jobs.

Example: Eddy currents inspection

A major European steel producer can no longer compete with cheap Asian competition solely through price. The company strategy is therefore a superior quality of its steel products (tubes, plates, etc.). It plans to replace the old automated systems, that detect the defects by analyzing the signals from defectoscopes using rigid and complicated system of rules, with modern systems based on artificial intelligence and neural networks.

These modern systems can replicate the work of the best experts from the defectoscopy (quality inspection) department and identify even very complex and ambiguous defects of products. Furthermore, the system continually improves and will soon bring the reliability of the process to a whole new level.