POTENTIAL IDEA OF MASTER THESIS

by Arshan Abbas

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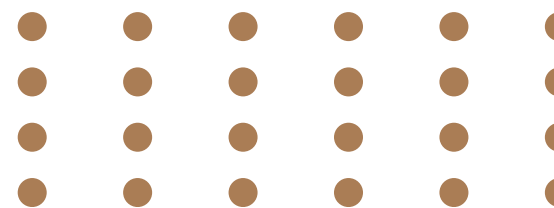
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- Studying full time master in computer science

- Prior experience in object detection and machine learning practices

- Participation in related projects: BlendEd Mobility by Erasmus+, Data Science Seminar by ISG chair; Uni Siegen, and at work place (Technologie-Institut für Metall und Engineering GmbH)
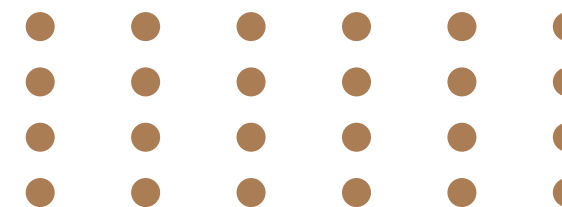
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- Company: Technologie-Institut für Metall und Engineering GmbH

- Application-oriented research organisation: Testing and application development in simulation, welding and joining techniques or altogether engineering

- Based in: Wissen – Sieg (40 Min drive from Siegen)

- Approx Employees: ≤20

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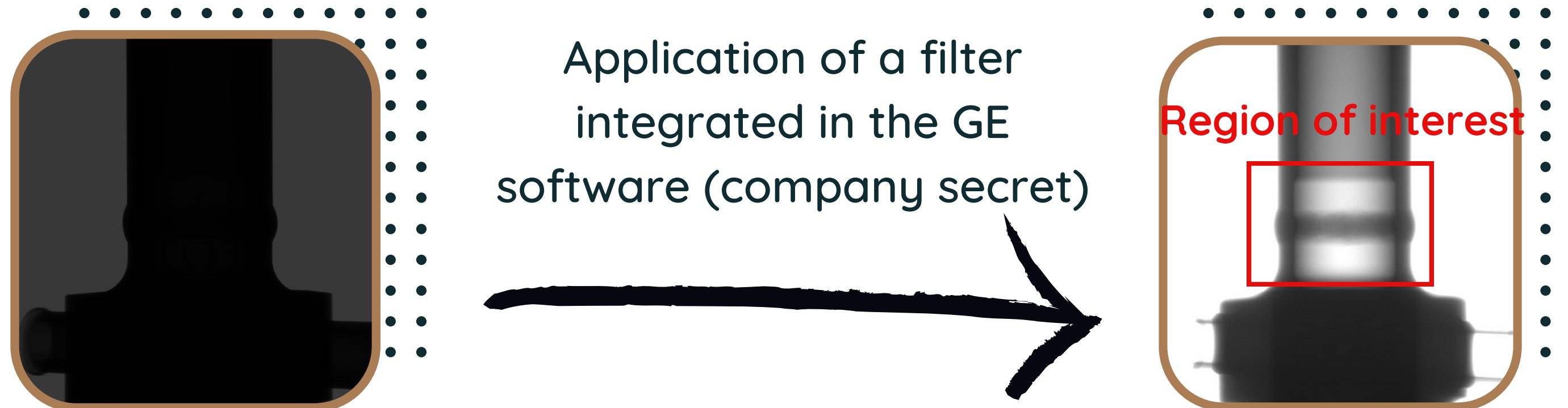Naturwissenschaftlich-Technische Fakultät

- Pipe system with 14 welds

- 100% inspection by Xray: Xray system from GE

- Xrays are taken after every weld. The next weld is only carried out after the test has been passed.

- Xray images are currently produced and analyzed manually

Application of a filter integrated in the GE software (company secret)

Region of interest

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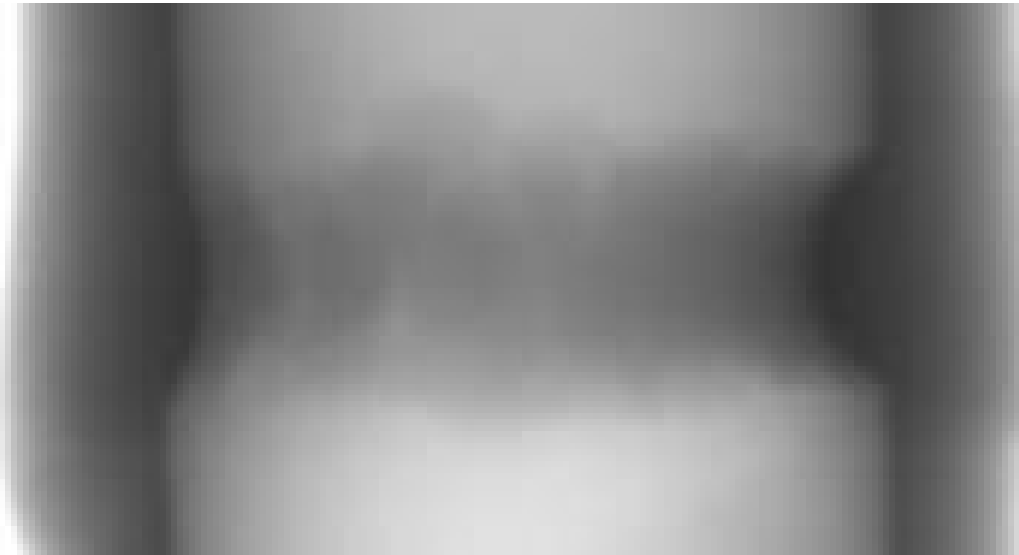
Overview of the different weld seam positions on the pipe

Possible error

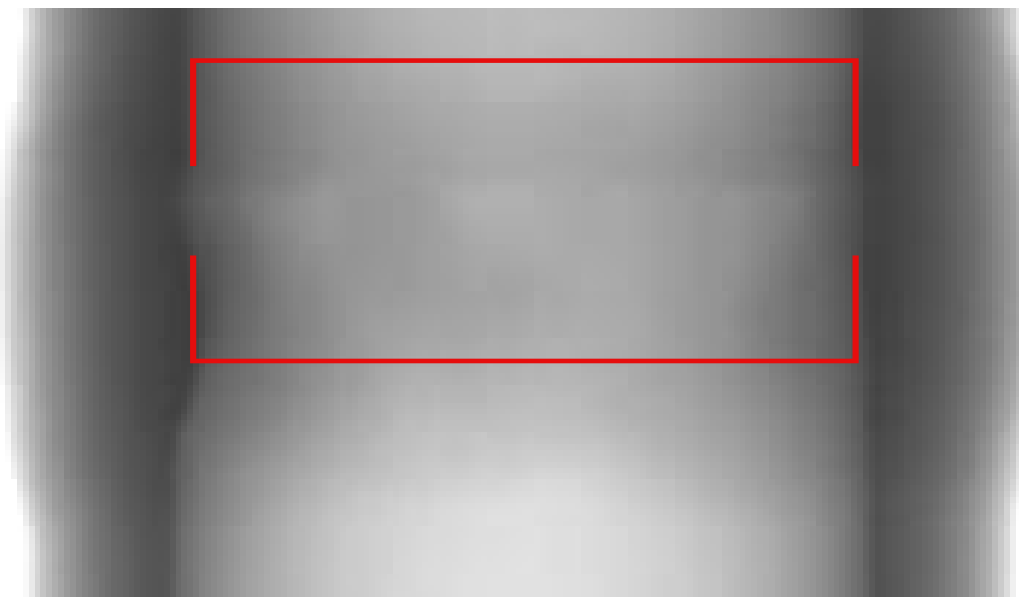Binding error (defect number 401)

Pore (defect number 2011)

Insufficient welding (defect number 402)
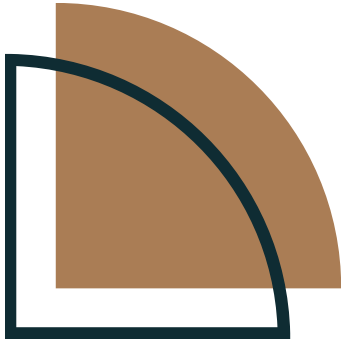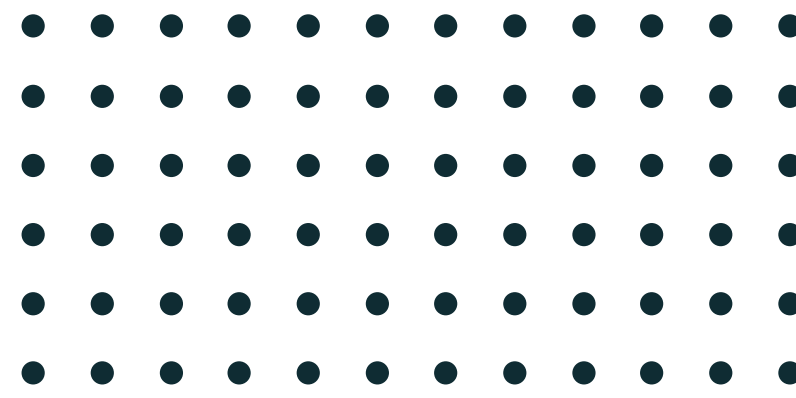
Tungsten inclusion (defect number 3041)

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Examine and apply different filters to the tif files

Setting up a data pipeline to provide the images for processing in an AI

Research, implementation and analysis of different AI algorithms for the detection of the four error types.
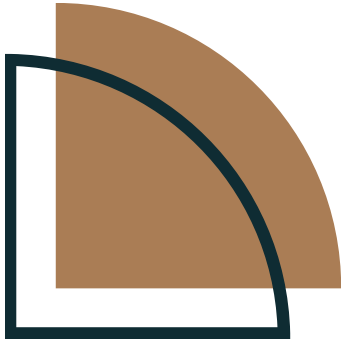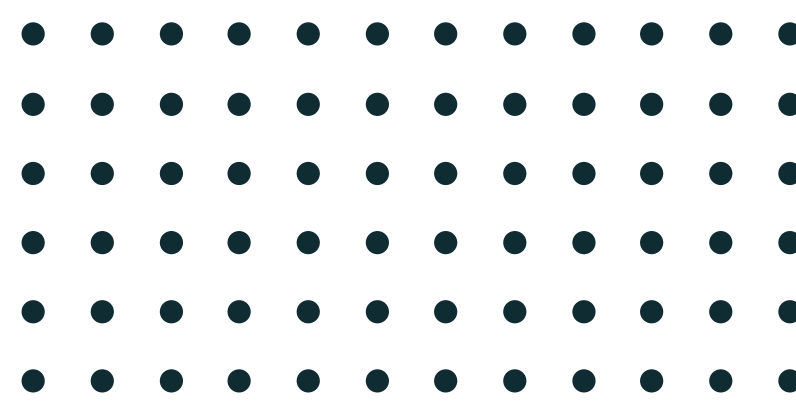
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Selection of the best algorithm(s) and complete implementation

Written elaboration and presentation of the results as well as documentation of the created code

The entire work is to be implemented using the Python programming language and the Pytorch AI framework as well as other freely available libraries.
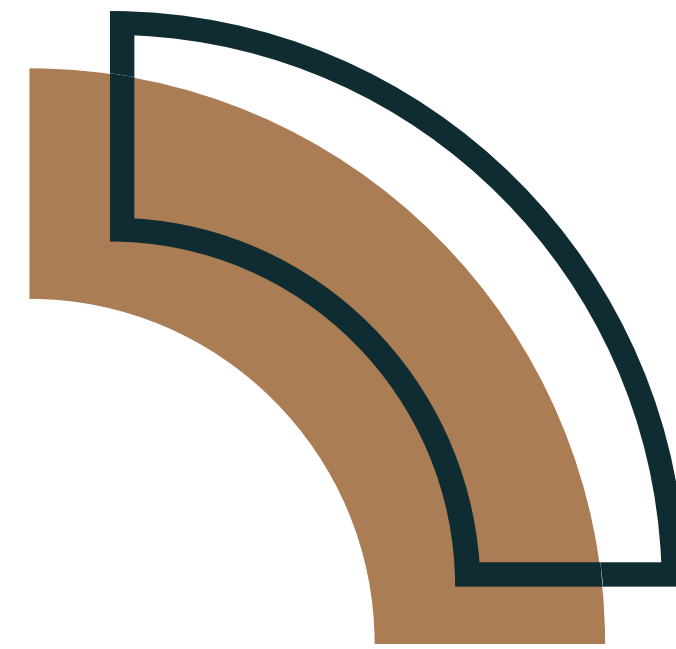
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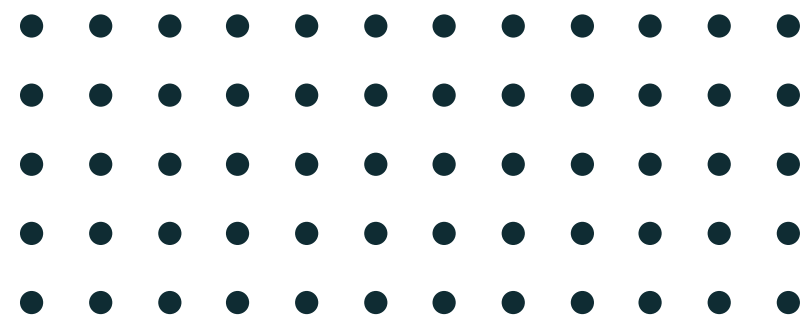Naturwissenschaftlich-
Technische Fakultät

- Would you like to supervise me on the topic?

- A meeting with you for discussing future course of action

- A meeting between you, me and the company

- Finalizing of start date

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THANK YOU