

Practical course/Thesis Opportunity in Out-of-Distribution Detection for Computer Vision

Company: Vision4Quality GmbH

Location: Würzburg

Position Type: Practicum/Thesis Project

Field: Computer Vision, Machine Learning, Industrial Quality Control

About Us

At Vision4Quality we are leaders in industrial quality control, leveraging cutting-edge computer vision technologies to ensure the highest standards in manufacturing and production. We are passionate about innovation and are constantly pushing the boundaries of what's possible in automated visual inspection.

The Project

Topic: *Out-of-Distribution (OOD) Detection for Computer Vision Applications*

We invite a motivated student to join us in tackling a key challenge in industrial quality control: filtering out images that do not conform to a "normal" distribution of product images. This project will involve researching, implementing, and comparing state-of-the-art methods for OOD detection, with a focus on real-time performance.

The final goal is to integrate the best method into our existing software solution, ensuring it meets our speed and accuracy requirements.

Your Responsibilities

- **Research:** Review state-of-the-art methods for OOD detection and identify approaches suitable for our use case.
 - **Implementation:** Develop and test multiple OOD detection methods, such as:
 - Feature-based clustering or statistical distance methods
 - Autoencoder or reconstruction-based approaches
 - Pre-trained model-based classifiers
 - **Evaluation:** Analyze methods against key metrics, including accuracy, false positive rate, and speed.
 - **Integration:** Optimize and integrate the best-performing method into our software solution.
 - **Documentation:** Provide a detailed report on findings and implementation.
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What We're Looking For

- **Educational Background:** Enrolled in a Bachelor's or Master's program in Computer Science, Artificial Intelligence, Data Science, or a related field.
 - **Technical Skills:**
 - Proficiency in Python (e.g., PyTorch, TensorFlow, Scikit-learn)
 - Experience with machine learning and computer vision
 - **Soft Skills:** Analytical mindset, attention to detail, and a passion for solving challenging problems.
 - **Preferred:** Familiarity with industrial quality control or real-time systems.
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What We Offer

- Hands-on experience with real-world computer vision challenges
 - Access to state-of-the-art tools and datasets
 - Guidance from experienced professionals in computer vision and machine learning
 - An opportunity to contribute to a solution that will be used in production
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How to Apply

Send your application to **personal@vision4quality.de** with the subject line "*Practicum/Thesis Application – OOD Detection*". Please include:

1. Your CV.
 2. A very brief cover letter explaining your interest and relevant experience.
 3. (Optional) Examples of previous work (e.g., GitHub repository, academic projects).
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Join us to make an impact in the field of industrial quality control and bring innovation to life. We look forward to hearing from you!

Contact:

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