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PRESS RELEASE

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Karsten Roth wins EMVA Young Professional Award 2022

Next EMVA Business Conference 2023 will be held in Sevilla, Spain celebrating the associations' 20th anniversary

Brussels, Belgium; 16 May, 2022. The EMVA Young Professional Award 2022 goes to Karsten Roth for his work "Towards Total Recall in Industrial Anomaly Detection". The awardee was announced on 13 May during the 20th EMVA Business Conference in Brussels/Belgium, where he also had the opportunity to present his work as part of the regular conference program.

Karsten Roth is a PhD researcher with the Explainable Machine Learning group at the University of Tübingen as part of the International Max Planck Research School for Intelligent Systems (IMPRS-IS) and the European Laboratory for Learning and Intelligent Systems (ELLIS). He is co-supervised by Zeynep Akata and Oriol Vinyals (Deepmind). Karsten has completed both Bachelor and Master studies in Physics at Heidelberg University in 2021, and has spent time abroad in Canada as a researcher at the Montreal Institute for Learning Algorithms (MILA) and the Vector Institute in Toronto, working on all manners of representation learning. He has also worked as a research intern at the Amazon AWS research lablet in Tuebingen on Anomaly Detection.

Awarded Work: Towards Total Recall in Industrial Anomaly Detection

Automated industrial anomaly detection and visual inspection for manufacturing is one of the most successful applications of computer vision in industry with significant return-on-investment, as being able to spot defective parts is a critical component in large-scale industrial manufacturing. A particular challenge is the cold-start problem, in which a model only has access to nominal (non-defective) example images during training as images of potential downstream defects may not be available, or completely unknown defects may be encountered during production that still need to be detected. Instead of developing handcrafted solutions specific to each task and manufacturing problem, an ideal system should be deployable on arbitrary tasks while achieving state-of-the-art detection performance. In addition, such an anomaly detection system should be scalable, sample-efficient and fast.

As part of the research work, a novel automated visual anomaly detection method - PatchCore - was developed that satisfies all key criteria. In particular, a nominal image is broken down into regions represented by features extracted from standard pretrained deep neural networks. As such, no specific network training has to be performed, which makes PatchCore task agnostic. For all training images, a joint memory is utilized to aggregate all extractable nominal features, which retains a maximal amount of nominal context to make PatchCore as sample-efficient as possible. Scalability and inference speed are subsequently achieved by significantly reducing the memory through an advanced subsampling approach which still retains all relevant information. This memory of "normality" can then be utilized to both determine anomalous images as well as localize anomalous areas efficiently. A large range of experimental studies highlight a significant improvement over the previous state-of-the-art at low inference times, matching the performance of competitors with only a fraction of the available data.

About the EMVA Young Professional Award

The EMVA Young Professional Award is an annual award to honor the outstanding and innovative work of a student or a young professional in the field of machine vision or image

processing. It is the goal of the European Machine Vision Association EMVA to further support innovation in the machine vision industry, to contribute to the important aspect of dedicated machine vision education and to provide a bridge between research and industry. With the annual Young Professional Award the EMVA intends to specifically encourage students to focus on challenges in the field of machine vision and to apply latest research results and findings in computer vision to the practical needs of the industry. The Award winner is presented during the EMVA Business Conference.

Next EMVA Business conference takes place in Seville/Spain
Celebrating its 20th anniversary next year the EMVA will return to its founding county Spain. The next EMVA Business Conference will be held in Seville, the date will be announced soon.

Photo: EMVA Young Professional Award Winner Karsten Roth (left), EMVA President Dr. Chris Yates; Picture source: EMVA

About EMVA
Founded in 2003, the European Machine Vision Association (EMVA) is a non-for-profit and non-commercial association representing the Machine Vision industry in Europe that is open for all types of organizations having a stake in machine vision, computer vision, embedded vision or imaging technologies: manufacturers, system and machine builders, integrators, distributors, consultancies, research organizations and academia. The EMVA hosts four international vision standards, and all members – as the 100% owners of the association – benefit from the dedicated networking, standardization, and cooperation activities of the EMVA. www.emva.org.