SEMINAR ANNOUNCEMENT

Wednesday February 26th, 2025

at 10:00 am
Room "Sala Seminari" - Abacus Building (U14)

Anomaly Detection in Images

Speaker
Prof. Giacomo Boracchi

Politecnico di Milano, DEIB - Dipartimento di
Elettronica, Informazione e Bioingegneria

Abstract

Anomalies are typically the most informative samples in an image, e.g., defects in images used for quality control. Promptly and accurately locating anomalies is a primary concern, since these might provide precious information for automatically spotting defects, raising alarms, and possibly activating countermeasures. During this talk, I will give a rigorous formulation of the anomaly-detection problem and an overview of a few solutions developed in our laboratory. I will first introduce anomaly- detection methods based on dictionaries yielding sparse representations, which require limited training data and can be adapted to different settings. Then, I will illustrate structured-based anomaly-detection problems and conclude with deep learning models enabling zero-shot anomaly detection.

Short Bio

Giacomo Boracchi is Associate Professor of Computer Engineering at Dipartimento di Elettronica, Informazione e Bioingegneria of the Politecnico di Milano (DEIB). Giacomo has received a Ph.D. in information technology (DEIB, 2008), and an MSc degree in Mathematics (Universitá Statale di Milano, 2004). His primary research interests concern image processing and machine learning, particularly image restoration and analysis, change/anomaly detection, domain adaptation, and learning in nonstationary environments. He has been/currently is the advisor of 12 Ph.D. students, regularly teaching deep learning and image processing courses and giving tutorials at major conferences (ICASSP, ICIP, ICPR, IJCNN).
He is currently leading industrial research projects with Huawei, STMicroelectronics, Gilardoni Raggi X, and Cisco, among others. He is the author of more than 100 papers in international conferences and journals, and in 2018 - 2024 he has served as an Associate Editor for the IEEE Transactions on Image Processing. In 2015 he received the IBM Faculty Award; in 2016 the IEEE Transactions on Neural Networks and Learning Systems Outstanding Paper Award; in 2017, the Nokia Visiting Professor Scholarship; in 2021 and 2024, an nVidia Applied Research Grant.

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