



"I am a researcher specializing in interpretable machine learning for medical image analysis, with industry experience in the automotive and medical domains. My passion lies in uncovering patterns within large healthy populations to revolutionize healthcare screening. I am excited to contribute to the future of machine intelligence and eagerly seek new challenges in my pursuit of scientific breakthroughs."



COSMIN I. BERCEA

Researcher
Interpretable Machine Learning



+49(0) 1520 3536564
Munich, Germany
cosmin@bercea.net
<https://ci.bercea.net>

Languages

Romanian: native
German: native
English: fluent

EDUCATION

TUM: TECHNICAL UNIVERSITY OF MUNICH

2020 - 2023 (Dr. RER.NAT. COMPUTER SCIENCE) - MUNICH, GERMANY
Prof. Dr. Julia Schnabel, Prof. Dr. Daniel Rückert

- Interpretable machine learning in medical image analysis

KING'S COLLEGE LONDON

Dr. Andrew King, Prof. Dr. Julia Schnabel

2023 (VISITING RESEARCHER) - LONDON, UK

- Biases in unsupervised representation learning

FAU: UNIVERSITY ERLANGEN-NUREMBERG

Prof. Dr. Andreas Maier

2011 - 2018 (B/M.Sc., COMPUTER SCIENCE)

- GRADE 1.6, ERLANGEN, GERMANY

- Pattern recognition and medical image analysis

UAB: UNIVERSITAT AUTONOMA DE BARCELONA

2016 (EXCHANGE SEMESTER) - BARCELONA, SPAIN

- Deep learning and computer vision

TEACHING EXPERIENCE

LEAD: SEMINAR @TUM

2023 SOSE: UNSUPERVISED ANOMALY DETECTION IN MEDICAL IMAGING

2022 WISE: DEEP MEDICAL ANOMALY SEGMENTATION

TUTOR: COURSE @TUM

2023 SOSE AI IN MEDICINE I

2023 WISE: AI IN MEDICINE II

TUTOR: SEMINAR @TUM

2021 WISE: FEDERATED LEARNING

2021 SOSE: FEDERATED LEARNING

STUDENTS

SUPERVISING MASTER THESIS AND GUIDED-RESEARCH PROJECTS



WORK EXPERIENCE

KING'S COLLEGE LONDON - VISITING RESEARCHER

2023 - (2 MONTHS) - LONDON, UK

Dr. Esther Puyol-Antón, Dr. Andrew King, Prof. Dr. Julia Schnabel

- Explored potential biases in normative representation learning from large populations to advance healthcare screening

HELMHOLTZ CENTER MUNICH - DOCTORAL RESEARCHER

2020 - 2023 - MUNICH, GERMANY

Prof. Dr. Julia Schnabel, Prof. Dr. Daniel Rückert

- Enhanced understanding, robustness, and generalizability of generative models in unsupervised anomaly detection

BOSCH CORPORATE RESEARCH - RESEARCH ENGINEER CV/ML

2018 - 2020 (2 YEARS) - HILDESHEIM, GERMANY

Dr.-Ing. Niklas Beuter

- Solved challenging perception and behaviour prediction tasks in the field of scene understanding and interior monitoring

SIEMENS HEALTHINEERS - RESEARCH INTERN

2017 - 2018 (1 YEAR | 7 MONTHS) - ERLANGEN, GERMANY

Dr.rer.nat. Olivier Pauly, Dr.-Ing. Florin C. Ghesu

- Improved accuracy and robustness of lung segmentation on chest X-rays by reducing the number of failures by 50%
- Developed novel recurrent neural networks that share a memory module

COMPUTER VISION CENTER - RESEARCH INTERN

2016 (6 MONTHS) - BARCELONA, SPAIN

Prof. Dr. Petia Radeva

- Developed a temporal deep learning model for ego-centric action recognition

FAU PATTERN RECOGNITION LAB - RESEARCH INTERN

2015-2016 (1 YEAR) - ERLANGEN, GERMANY

Dr.-Ing. Thomas Köhler, Prof. Dr.-Ing. habil. Andreas Maier

- Increased state-of-the-art image super-resolution by 3.0 dB by implementing a novel, robust multi-frame super-resolution method

FRAUNHOFER IIS - RESEARCH ASSISTANT

2013-2017 (2 YEARS | 10 MONTHS) - NUREMBERG, GERMANY

Dr.-Ing. Christopher Mutschler

- Implemented cheap and efficient camera-based indoor localisation for VR
- Assured QoS in a complex event processing systems (C++)



PUBLICATIONS

Cosmin I. Bercea, Michael Neumayr, Daniel Rueckert, and Julia A. Schnabel. "Mask, Stitch, and Re-Sample: Enhancing Robustness and Generalizability in Anomaly Detection through Automatic Diffusion Models." ICML IMLH, 2023

Cosmin I. Bercea, Benedikt Wiestler, Daniel Rueckert, and Julia A. Schnabel. "Reversing the Abnormal: Pseudo-Healthy Generative Networks for Anomaly Detection." MICCAI, 2023

Cosmin I. Bercea, Daniel Rueckert, and Julia A. Schnabel. "What do AEs learn? Challenging Common Assumptions in Unsupervised Anomaly Detection." MICCAI, 2023

Cosmin I. Bercea, Benedikt Wiestler, Daniel Rueckert, and Julia A. Schnabel. "Generalizing Unsupervised Anomaly Detection: Towards Unbiased Pathology Screening." MIDL, 2023

Cosmin I. Bercea, Benedikt Wiestler, Daniel Rueckert, and Shadi Albarqouni. "Federated disentangled representation learning for unsupervised brain anomaly detection." Nature Machine Intelligence, 2022

Cosmin I. Bercea, Olivier Pauly, Andreas K. Maier, Florin C. Ghesu: "SHAMANN: Shared Memory Augmented Neural Networks", IPMI, 2019

Cosmin Bercea, A. Maier, T. Köhler: "Confidence-aware Levenberg-Marquardt optimization for joint motion estimation and super-resolution", ICIP, 2016