

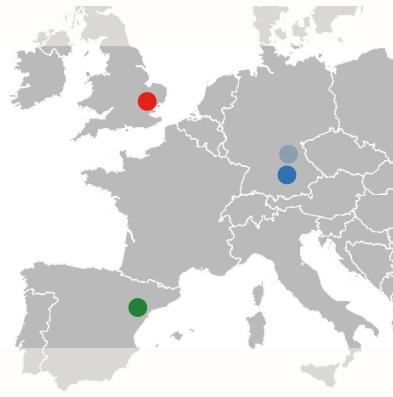


COSMIN I. BERCEA

Postdoctoral Researcher in
Generative AI / Medical Imaging



EDUCATION



Doctoral Researcher • 2020-2024 • Munich
Technical University Munich

Generative AI for Anomaly Detection

✉ Prof. Schnabel • Prof. Rückert

Visiting Researcher • 2023 • London
King's College London

Bias in Unsupervised Learning

✉ Prof. King • Dr. Puyol-Anton

B.Sc. / M.Sc. CS • 2011-2018 • Erlangen
FAU Erlangen-Nuremberg

Pattern Recognition & Medical Imaging

✉ Prof. Maier

Visiting Researcher • 2016 • Barcelona
Universitat Autònoma de Barcelona

Deep Learning & Computer Vision

✉ Prof. Radeva



I develop generative AI to reason about the **unseen** for early and rare pathology detection in large-scale medical imaging.

ACADEMIC SERVICE

MICCAI Student Board
Scientific Events Officer

MICCAI • 2025
Area/Session Chair

MICCAI • MEDIA • TMI
Reviewer

MICCAI EMERGE WORKSHOP
Organizer

MedEurIPS WORKSHOP
Organizer

EXPERIENCE

Postdoctoral Researcher • 2024-2026 • Munich

TUM: Multimodal AI for Rare Disease Detection

PhD Researcher • 2020-2024 • Munich

Helmholtz / TUM: Generative AI for Anomaly Detection

Research Engineer • 2018-2020 • Hildesheim

Bosch Research: Machine Learning for Vision in Autonomous Driving

Research Assistant • 2017-2018 • Erlangen

Siemens Healthineers: Machine Learning for Medical Imaging

Research Assistant • 2016 • Barcelona

Computer Vision Center: Machine Learning for Action Recognition

Research Assistant • 2013-2017 • Nuremberg

Fraunhofer IIS: Machine Learning and Virtual Reality

EMPOWERING THE NEXT GENERATION

As part of my involvement in the MICCAI Student Board I have been able to initiate and support student-focused activities within the medical imaging community. In parallel, I have been leading graduate-level seminars since 2022 and contributed to the AI in Medicine course at TUM.

Selected Student Outcomes



Early Accept



Best Paper Award



High Impact Paper

WACV • 2026

Jun Li

*"Knowledge to Sight:
Reasoning over Visual
Attributes via Knowledge
Decomposition for
Abnormality Grounding"*

MICCAI EMERGE • 2024

Yigit Avci

*"Unsupervised Analysis of
Alzheimer's Disease
Signatures using 3D
Deformable Autoencoders"*

ICML IMLH • 2023

Michael Neumayr

*"Mask, Stitch, and Re-Sample:
Enhancing Robustness and
Generalizability in Anomaly
Detection through Automatic
Diffusion Models"*

Munich, 2026, Cosmin I. Bercea



GERMAN, ROMANIAN - NATIVE, ENGLISH - FLUENT



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SELECTED CONTRIBUTIONS

NeurIPS (Oral) • 2025 • San Diego

NOVA: A Benchmark for Anomaly Localization and Clinical Reasoning in Brain MRI

Cosmin I Bercea, Jun Li, Philipp Raffler, Evamaria Olga Riedel, Lena Schmitzer, Angela Kurz, Felix Bitzer, Paula Roßmüller, Julian Canisius, Mirjam L Beyrle, Che Liu, Wenjia Bai, Bernhard Kainz, Julia A Schnabel, Benedikt Wiestler

A zero-shot, evaluation-only benchmark featuring 281 rare pathologies and 900 multi-modal scans, designed to stress-test vision-language models on their ability to bridge the distribution gap between spatial detection and clinical description.

WHY IT MATTERS

Exposes a significant 'reasoning gap' in current VLMs, where performance on rare clinical cases remains substantially below resident-level expertise despite high-quality visual inputs.

Nature Communications • 2025

Evaluating Normative Representation Learning in Generative AI for Robust Anomaly Detection in Brain Imaging

Cosmin I Bercea, Benedikt Wiestler, Daniel Rueckert, Julia Schnabel

A systematic study introducing metrics (RQI, AHI, CACI) to evaluate how well generative models learn 'normative' anatomy, validated by a multi-reader study comparing AI-generated counterfactuals against radiologist judgment.

WHY IT MATTERS

Demonstrates that standard reconstruction metrics (PSNR/SSIM) are poor proxies for clinical utility, advocating for evaluation focused on the anatomical plausibility of the 'healthy' restoration.

MICCAI • 2023 • Marrakech

Reversing the Abnormal: Pseudo-Healthy Generative Networks for Anomaly Detection

Cosmin I Bercea, Benedikt Wiestler, Daniel Rueckert, Julia Schnabel

Introduces PHANES, a framework that avoids image-wide stochastic alterations by using latent generative networks to selectively mask and inpaint abnormal regions while preserving the patient's healthy anatomy.

WHY IT MATTERS

Provides a more stable alternative to global diffusion-based reconstruction, significantly reducing false positives in the detection of focal lesions like stroke.

REFEREES

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Prof. Bernhard Kainz

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Prof. Wenjia Bai