Patrick Godau

https://godaup.github.io/
github.com/godaup
>1900 citations, h-index: 16
(+49) 6221 42 3021
patrick.godau@dkfz.de
Im Neuenheimer Feld 223, 69120 Heidelberg, Germany

Research Focus

Current:	**Surgical Foundation Models**
Ph.D.:	Deep Learning for Biomedical Imaging
Master's:	Algorithmic Randomness, Theoretical Computer Science

Education

Ph.D. in Computer Science — Jul 2025
Heidelberg University — *Heidelberg, Germany*
Dissertation: Lifelong Machine Learning for Biomedical Image Classification — *Advisor: Prof. Lena Maier-Hein*

M.Sc. in Mathematics — Apr 2019

B.Sc. in Computer Science — Oct 2018

B.Sc. in Mathematics — Oct 2015

Abitur (highest German school qualification) — Jun 2012

Research Experience

Postdoctoral Researcher — **since Jul 2025**
Division of Intelligent Medical Systems, German Cancer Research Center

- Lead development of Surgical Foundation Model on the infrastructure of the J ü lich Supercomputing Centre.
- Coordinate international competition of Vision Language Models for multimodal surgical video understanding.

Group Lead — **since Jun 2022**
Division of Intelligent Medical Systems, German Cancer Research Center

- Provide long-term mentorship and project management assistance for about 10-15 master & Ph.D. students.
- Coordinate and contribute to moonshot projects and make strategic decisions for the group development.

Doctoral Researcher — **May 2019 - Jul 2025**
Division of Intelligent Medical Systems, German Cancer Research Center

- Created and open-sourced the *Medical Meta Learner* Python package for medical imaging deep learning workflows, which has been used in 5 publications and trained more than 100,000 models.
- Pioneered methodology for knowledge transfer between datasets in data-scarce and privacy-sensitive environments plus a novel workflow improving model robustness to domain shifts in deployment.
- Established AI evaluation standards for biomedical imaging through leadership in the international Metrics Reloaded initiative with collaboration partners from 18 countries.

Research Assistant — **May 2016 - Nov 2017**
Division of Computer-Assisted Medical Interventions, German Cancer Research Center

- Developed meta-model for biomedical imaging challenges, standardizing data collection from >150 competitions.
- Conducted statistical analyses on ranking robustness of competition results, uncovering evaluation weaknesses.

Peer Reviewing

IEEE Transactions on Medical Imaging — since 2025
International Journal of Computer Assisted Radiology and Surgery — since 2025
MICCAI Challenges — since 2020

Awards

Medical Image Analysis MICCAI 2023 Best Paper Award 2024
Winner of *SAGES Critical View of Safety Challenge* (category: robustness) 2024
MICCAI 2023 - Best Challenge Reviewer Award (2nd place) 2023
Winner of *Workflow Recognition in Endoscopic Pituitary Surgery* Challenge (category: instrument recognition) 2023
Winner of *CholecTriplet2022 Surgical Action Triplet Detection* Challenge (tasks: detection & classification) 2022
Winner of *EndoCV'22 Endoscopy Computer Vision Challenge* (task: polyp detection) 2022
Winner of *Gastrointestinal ImAge ANAlysis (GIANA)* Challenge (task: polyp classification) 2021
MICCAI 2020 - Best Challenge Reviewer Award (1st place) 2020
Winner of *HIDA Datathon on Grand Challenges on Climate Change* 2020

Teaching & Supervision Experience

Master's Thesis Supervision **since 2021**

- Completed supervision for three master students on topics of *Graph Neural Networks in Health Data Science* (2021), *Multi-task Learning in Surgical Data Science* (2022), and *Autonomous Robotics for Surgery* (2025).
- Currently supervising a student on *Self-Supervised Learning for Surgical Videos* (until 12/2025).

Graduate Seminar Organizer **Heidelberg University** **WS20/21 & WS21/22**

- Organized graduate seminar "Deep Learning in Medical Image Analysis", with curriculum covering state-of-the-art techniques in medical imaging (e.g., nnUnet, Federated Learning, Causality).
- Mentored students in critical analysis of current literature, presentation skills and providing feedback to peers.

Academic Tutor **Heidelberg University** **between 2013 - 2018**

- Tutored six semesters of undergraduate courses: *Linear Algebra, Theoretical Computer Science, Mathematical Logic*, thereby led weekly tutorial sessions translating complex theoretical concepts into accessible examples.
- Maintained consistently high student evaluations for clarity, accessibility, and outstanding commitment.

Conferences and Presentations

Invited Talks

- *CZI Virtual Cells Workshop (2024)*
  AI Modeling Benchmarking and Evaluation for Biology

Oral Presentations

- *Int. Conference on Medical Image Computing and Computer-Assisted Intervention (2023)*
  Deployment of image analysis algorithms under prevalence shifts *(top 25/2253 reviewed submissions)*
- *Int. Conference on Medical Image Computing and Computer-Assisted Intervention (2021)*
  Task Fingerprinting for Meta Learning in Biomedical Image Analysis *(top 60/1630 reviewed submissions)*

Poster Presentations

- *German Conference on Medical Image Computing (2022)*
  Task Fingerprinting for Meta Learning in Biomedical Image Analysis
- *Medical Imaging meets NeurIPS workshop (2020)*
  Quantification of Task Similarity for Efficient Knowledge Transfer in Biomedical Image Analysis

Research Publications (Selection)

Journal Articles

- **Godau, P.**, Kalinowski, P., Christodoulou, E., Reinke, A., Tizabi, M., Ferrer, L., ... & Maier-Hein, L. (2025). *Navigating prevalence shifts in image analysis algorithm deployment.* Medical image analysis
- Maier-Hein, L., Reinke, A., **Godau, P.**, Tizabi, M. D., Buettner, F., Christodoulou, E., ... & Jäger, P. F. (2024). *Metrics reloaded: recommendations for image analysis validation.* Nature methods
- Reinke, A., Tizabi, M. D., Baumgartner, M., Eisenmann, M., Heckmann-Nötzel, D., Kavur, A. E., ... & Maier-Hein, L. (2024). *Understanding metric-related pitfalls in image analysis validation.* Nature methods
- Maier-Hein, L., Wagner, M., Ross, T., Reinke, A., Bodenstedt, S., Full, P. M., ... & M ü ller-Stich, B. P. (2021). *Heidelberg colorectal data set for surgical data science in the sensor operating room.* Scientific data
- Maier-Hein, L., Eisenmann, M., Reinke, A., Onogur, S., Stankovic, M., **Scholz, P.**, ... & Kopp-Schneider, A. (2018). *Why rankings of biomedical image analysis competitions should be interpreted with care.* Nature communications

Conference Papers

- **Godau, P.**, Kalinowski, P., Christodoulou, E., Reinke, A., Tizabi, M., Ferrer, L., ... & Maier-Hein, L. (2023). *Deployment of image analysis algorithms under prevalence shifts.* International Conference on Medical Image Computing and Computer-Assisted Intervention
- Yamlahi, A., Tran, T. N., **Godau, P.**, Schellenberg, M., Michael, D., Smidt, F. H., ... & Maier-Hein, L. (2023). *Self-distillation for surgical action recognition.* International Conference on Medical Image Computing and Computer-Assisted Intervention
- Eisenmann, M., Reinke, A., Weru, V., Tizabi, M. D., Isensee, F., Adler, T. J., ... & Maier-Hein, L. (2023). *Why is the winner the best?.* IEEE/CVF Conference on Computer Vision and Pattern Recognition
- Tran, T. N., Adler, T. J., Yamlahi, A., Christodoulou, E., **Godau, P.**, Reinke, A., ... & Maier-Hein, L. (2023). *Sources of performance variability in deep learning-based polyp detection.* International Conference on Information Processing in Computer-Assisted Interventions
- **Godau, P.**, & Maier-Hein, L. (2021). *Task Fingerprinting for Meta Learning in Biomedical Image Analysis.* International Conference on Medical Image Computing and Computer-Assisted Intervention

Languages & Skills

Machine Learning: Deep Learning, Foundation Models, Transfer Learning, Computer Vision (image classification, semantic segmentation), Lifelong & Meta-Learning, Hyperparameter Optimization, Model Validation
Programming: Proficient in Python, familiar with Java, C++, JavaScript / HTML / CSS, SQL, Haskell
Tools and Frameworks: PyTorch, Git, GitHub & CI/CD, Scikit-learn, Pandas, NumPy, Plotly, Pytest, Docker
Languages: English (proficient), German (native), French (basic)