





Patrick Godau


 <https://godaup.github.io/>

 github.com/godaup

 about 1900 citations, h-index: 16

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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 (summa cum laude)	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 Jülich 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 <i>SAGES Critical View of Safety Challenge</i> (category: robustness)	2024
MICCAI 2023 - Best Challenge Reviewer Award (2nd place)	2023
Winner of <i>Workflow Recognition in Endoscopic Pituitary Surgery Challenge</i> (category: instrument recognition)	2023
Winner of <i>CholecTriplet2022 Surgical Action Triplet Detection Challenge</i> (tasks: detection & classification)	2022
Winner of <i>EndoCV'22 Endoscopy Computer Vision Challenge</i> (task: polyp detection)	2022
Winner of <i>Gastrointestinal ImAge ANALysis (GIANA) Challenge</i> (task: polyp classification)	2021
MICCAI 2020 - Best Challenge Reviewer Award (1st place)	2020
Winner of <i>HIDA Datathon on Grand Challenges on Climate Change</i>	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., ... & Müller-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)