Professor Julia A. Schnabel, PhD
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Biographical details

Since 5/2021, Julia is Professor in Computational Imaging and AI in Medicine (TUM Liesel Beckmann Distinguished Professorship) at Technical University of Munich, and Helmholtz Distinguished Professor at Helmholtz Center Munich for Health and Environment. She retains a part-time appointment at King's College London in her current academic role.
Julia Schnabel joined King's College London in July 2015 as Chair in Computational Imaging at the School of Biomedical Engineering and Imaging Sciences, where until 2020 she has been the Director of the EPSRC Centre for Doctoral Training in Smart Medical Imaging, jointly run by King's College London and Imperial College London. From 2018-21 she has been School Lead for Research & Impact, and Deputy Director of the NIHR funded Medtech and In vitro diagnostic Co-operative (MIC) in Cardiovascular Diseases.
Julia is elected member of the MICCAI Society Board (2017-21) and the IEEE EMBS Administrative Committee (2017-19, re-elected 2020-22). She has also been a member of the Inria Science Board (2017-20) and the EPSRC Strategic Advisory Team (SAT) in Healthcare Technology (2018-21). In 2018 Julia was elected MICCAI Fellow "*For contributions to multiple areas of medical image computing, and for distinguished service to the MICCAI conference and Society*", and in 2019 she became Fellow of the European Laboratory for Learning and Intelligent Systems (ELLIS). In 2021 Julia was elected Fellow of IEEE "*For contributions to medical image computing*", and in 2024 the German Röntgen Society awarded her the prestigious Alfred-Breit prize "*For her outstanding achievements in the field of medical imaging*".

Education

PhD in Computer Science, University College London, University of London, UK. January 1994 → February 1998.

MSc in Computer Science, Technische Universität Berlin, Germany. October 1989 → September 1993

Honorary Posts

Visiting Professor in Engineering Science, University of Oxford. Aug 2015 → Aug 2018

Visiting Professor, Nagoya University Mar 2013 → Apr 2014

Honorary Senior Research Associate, Department of Computer Science, University College London Nov 2007 → Nov 2012

Previous Posts

Professor of Engineering Science, University of Oxford, in association with a Tutorial Fellowship in Engineering, St. Hilda's College, Oxford. July 2014 → June 2015

Associate Professor in Engineering Science (Medical Imaging), University of Oxford, UK, in association with a Tutorial Fellowship in Engineering, St. Hilda's College, Oxford, UK. Sept 2007 → July 2014

Research Fellow, Centre for Medical Image Computing, University College, London, UK. January 2005 → August 2007

Research Fellow, Division of Radiological Sciences and Medical Engineering of Guy's, King's and St. Thomas' School of Medicine, King's College London, UK. September 1999 → December 2004

Research Associate, Image Sciences Institute, University Medical Center Utrecht, NL. July 1998 → August 1999

Research Assistant / Fellow, Department of Computer Science, University College London, UK. January 1997 → July 1998

Research interests

Julia's research interests are in machine/deep learning, nonlinear motion modelling, multi-modality, dynamic and quantitative imaging with applications in cancer, cardiovascular diseases, and fetal health. Her focus is on correcting complex types of motion, such as sliding organs or fetal movements, as well as imaging artefacts. She also has an interest in early disease detection, characterisation and prediction of response to treatment, with the aim of rapid translation into clinical practice for patient stratification and improved treatment outcome.
Julia has has successfully supervised over 20 doctoral students to completion, who have been receiving a number of prestigious Young Investigator Awards and a BMVA Doctoral Thesis prize.
Julia has co-/authored well over 200 peer-reviewed publications, is on the Steering Committee of IEEE Transactions on Medical Imaging, on the Editorial Board of Medical Image Analysis, and a Founding and Executive Editor of the Journal on Machine Learning for Medical Imaging (MELBA) She was previousy also Associate Editor of IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Medical Imaging, and IEEE Transactions on Biomedical Engineering.
Julia was a Director of the successful International Medical Imaging Summer School (MISS) exploring the interface between medical imaging, computer vision and machine/deep learning. She has been Programme Chair of the International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2018 held in Granada, Spain (miccai2018.org), and Chair of the 7th International Workshop on Biomedical Image Registration (WBIR) 2016 held in Las Vegas, USA, in conjunction with CVPR, as well as of WBIR 2022 held in Munich Germany. Julia was General Chair of the 27th International Conference on Information Processing in Medical Imaging (IPMI 2021), General Co-Chair of WBIR 2022 held in Munich, Germany, and is General Chair of MICCAI 2024 to be held in Marrakesh, Morocco, as well as General Chair of IPMI 2027 to be held in Lake Sacacomie, Quebec, Canada.

Awards

CDT - Self-supervised deep-learned physics-informed PET image reconstruction for oncology
Reader, A. (Primary Investigator) & Schnabel, J. (Co-Investigator)
Siemens Healthcare Ltd: £58,000.00
1/10/2023 → 30/09/2027

Research outputs

Multimodal spatial gradients to explain regional susceptibility to fibrillar tau in Alzheimer's disease
Alzheimer's Disease Neuroimaging Initiative (ADNI), May 2025, In: Alzheimer's & Dementia. 21, 5, p. e70170 e70170.

Deep learning model DeepNeo predicts neointimal tissue characterization using optical coherence tomography
Koch, V., Holmberg, O., Blum, E., Sancar, E., Aytekin, A., Seguchi, M., Xhepa, E., Wiebe, J., Cassese, S., Kufner, S., Kessler, T., Sager, H., Voll, F., Rheude, T., Lenz, T., Kastrati, A., Schunkert, H., Schnabel, J. A., Joner, M. & Marr, C. & 1 others, Nicol, P., 17 Apr 2025, In: Communications Medicine. 5, 1, p. 124 124.

Evaluating normative representation learning in generative AI for robust anomaly detection in brain imaging
Bercea, C. I., Wiestler, B., Rueckert, D. & Schnabel, J. A., 13 Feb 2025, (E-pub ahead of print) In: Nature Communications. 16, 1, 1624.

Complex-Valued Federated Learning with Differential Privacy and MRI Applications
Riess, A., Ziller, A., Kolek, S., Rueckert, D., Schnabel, J. & Kaissis, G., 2025, *Medical Image Computing and Computer Assisted Intervention – MICCAI 2024 Workshops - ISIC 2024, iMIMIC 2024, EARTH 2024, DeCaF 2024, Held in Conjunction with MICCAI 2024, Proceedings.* Celebi, M. E., Reyes, M., Chen, Z. & Li, X. (eds.). Springer Science and Business Media Deutschland GmbH, p. 191-203 13 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 15274 LNCS).

Enhancing the Utility of Privacy-Preserving Cancer Classification Using Synthetic Data
Osuala, R., Lang, D. M., Riess, A., Kaissis, G., Szafranowska, Z., Skorupko, G., Diaz, O., Schnabel, J. A. & Lekadir, K., 2025, *Artificial Intelligence and Imaging for Diagnostic and Treatment Challenges in Breast Care - 1st Deep Breast Workshop, Deep-Breath 2024, Held in Conjunction with MICCAI 2024, Proceedings.* Mann, R. M., Zhang, T., Han, L., Litjens, G., Tan, T., Truhn, D., Li, S., Gao, Y., Doyle, S., Martí Marly, R., Kather, J. N., Pinker-Domenig, K. & Wu, S. (eds.). Springer Science and Business Media Deutschland GmbH, p. 54-64 11 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 15451 LNCS).

FUTURE-AI: International consensus guideline for trustworthy and deployable artificial intelligence in healthcare
The FUTURE-AI Consortium, 2025, (Accepted/In press) In: BMJ. e081554.

Graph Neural Networks: A Suitable Alternative to MLPs in Latent 3D Medical Image Classification?
Kiechle, J., Lang, D. M., Fischer, S. M., Felsner, L., Peeken, J. C. & Schnabel, J. A., 2025, *Graphs in Biomedical Image Analysis - 6th International Workshop, GRAIL 2024, Held in Conjunction with MICCAI 2024, Proceedings.* Ahmadi, S.-A. & Kazi, A. (eds.). Springer Science and Business Media Deutschland GmbH, p. 12-22 11 p. (Lecture Notes in Computer Science; vol. 15182 LNCS).

Language Models Meet Anomaly Detection for Better Interpretability and Generalizability
Li, J., Kim, S. H., Müller, P., Felsner, L., Rueckert, D., Wiestler, B., Schnabel, J. A. & Bercea, C. I., 2025, *Medical Image Computing and Computer Assisted Intervention – MICCAI 2024 Workshops - LDTM 2024, MMMI/ML4MHD 2024, ML-CDS 2024, Held in Conjunction with MICCAI 2024, Proceedings.* Schroder, A., Li, X., Syeda-Mahmood, T., Oxtoby, N. P., Young, A., Hering, A., Mathai, T. S., Mukherjee, P., Kuckertz, S., He, T., Llorente-Saguer, I., Maier, A., Kashyap, S., Greenspan, H. & Madabhushi, A. (eds.). Springer Science and Business Media Deutschland GmbH, p. 113-123 11 p. (Lecture Notes in Computer Science; vol. 15401 LNCS).

Non-parametric Neighborhood Test-Time Generalization: Application to Medical Image Classification
Ambekar, S., Schnabel, J. A. & Lang, D. M., 2025, *Medical Information Computing - First MICCAI Meets Africa Workshop, MImA 2024, and First MICCAI Student Board Workshop on Empowering Medical Information Computing and Research through Early-Career Expertise, EMERGE 2024, Held in Conjunction with MICCAI 2024, Revised Selected Papers.* Anazodo, U., Akash, N., Fuchs, M., Cintas, C., Crimi, A., Mutsvangwa, T., Dako, F. & Ogallo, W. (eds.). Springer Science and Business Media Deutschland GmbH, p. 224-234 11 p. (Communications in Computer and Information Science; vol. 2240).

Unsupervised Analysis of Alzheimer's Disease Signatures Using 3D Deformable Autoencoders
Avci, M. Y., Chan, E., Zimmer, V., Rueckert, D., Wiestler, B., Schnabel, J. A. & Bercea, C. I., 2025, *Medical Information Computing - First MICCAI Meets Africa Workshop, MImA 2024, and First MICCAI Student Board Workshop on Empowering Medical Information Computing and Research through Early-Career Expertise, EMERGE 2024, Held in Conjunction with MICCAI 2024, Revised Selected Papers.* Anazodo, U., Akash, N., Fuchs, M., Cintas, C., Crimi, A., Mutsvangwa, T., Dako, F. & Ogallo, W. (eds.). Springer Science and Business Media Deutschland GmbH, p. 266-276 11 p. (Communications in Computer and Information Science; vol. 2240).

Simultaneous whole-liver water T 1 and T 2 mapping with isotropic resolution during free-breathing.
Stelter, J., Weiss, K., Steinhelfer, L., Spieker, V., Huaroc Moquillaza, E., Zhang, W., Makowski, M. R., Schnabel, J. A., Kainz, B., Braren, R. F. & Karampinos, D. C., Dec 2024, In: NMR in Biomedicine. 37, 12, p. e5216

Virtual Reality for Preprocedure Planning of Covered Stent Correction of Superior Sinus Venosus Atrial Septal Defects
Stephenson, N., Rosenthal, E., Jones, M., Deng, S., Wheeler, G., Pushparajah, K., Schnabel, J. A. & Simpson, J. M., 5 Nov 2024, (E-pub ahead of print) In: Circulation. Cardiovascular interventions. 17, 12, e013964.

Self-Supervised Deep Learned 3D Filtered Backprojection for Image Reconstruction Objectives with a Poisson Likelihood
Dassanayake, M., Schnabel, J. & Reader, A., 25 Sept 2024, *2024 IEEE Nuclear Science Symposium (NSS), Medical Imaging Conference (MIC) and Room Temperature Semiconductor Detector Conference (RTSD).* Tampa, FL, USA: IEEE , p. 1-1 1 p. (IEEE Symposium on Nuclear Science (NSS/MIC)).

LNQ 2023 challenge: Benchmark of weakly-supervised techniques for mediastinal lymph node quantification
Dorent, R., Khajavi, R., Idris, T., Ziegler, E., Somarouthu, B., Jacene, H., LaCasce, A., Deissler, J., Ehrhardt, J., Engelson, S., Fischer, S. M., Gu, Y., Handels, H., Kasai, S., Kondo, S., Maier-Hein, K., Schnabel, J. A., Wang, G., Wang, L. & Wald, T. & 7 others, Yang, G.-Z., Zhang, H., Zhang, M., Pieper, S., Harris, G., Kikinis, R. & Kapur, T., 19 Aug 2024, In: Machine.Learning.for.Biomedical.Imaging..

Mask the Unknown: Assessing Different Strategies to Handle Weak Annotations in the MICCAI2023 Mediastinal Lymph Node Quantification Challenge
Fischer, S. M., Kiechle, J., Lang, D. M., Peeken, J. C. & Schnabel, J. A., 20 Jun 2024, In: Machine.Learning.for.Biomedical.Imaging..

A Deep Learning-Based Integrated Framework for Quality-Aware Undersampled Cine Cardiac MRI Reconstruction and Analysis

MacHado, I., Puyol-Anton, E., Hammernik, K., Cruz, G., Ugurlu, D., Olakorede, I., Oksuz, I., Ruijsink, B., Castelo-Branco, M., Young, A., Prieto, C., Schnabel, J. & King, A., 1 Mar 2024, In: IEEE Transactions on Biomedical Engineering. 71, 3, p. 855-865 11 p.

Dosiomics and radiomics-based prediction of pneumonitis after radiotherapy and immune checkpoint inhibition: The relevance of fractionation

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Deep Learning for Retrospective Motion Correction in MRI: A Comprehensive Review

Spieker, V., Eichhorn, H., Hammernik, K., Rueckert, D., Preibisch, C., Karampinos, D. C. & Schnabel, J. A., 1 Feb 2024, In: IEEE Transactions on Medical Imaging. 43, 2, p. 846-859 14 p.

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Advancing Neonatal Care: A Deep Learning Approach for Non-Contact Heart Rate Monitoring

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Evaluation of Randomized Input Sampling for Explanation (RISE) for 3D XAI - Proof of Concept for Black-Box Brain-Hemorrhage Classification

Highton, J., Chong, Q. Z., Crawley, R., Schnabel, J. A. & Bhatia, K. K., 2024, *Proceedings of 2023 International Conference on Medical Imaging and Computer-Aided Diagnosis (MICAD 2023) - Medical Imaging and Computer-Aided Diagnosis.* Su, R., Zhang, Y.-D. & Frangi, A. F. (eds.). Springer Science and Business Media Deutschland GmbH, p. 41-51 11 p. (Lecture Notes in Electrical Engineering; vol. 1166 LNEE).

ICoNIK: Generating Respiratory-Resolved Abdominal MR Reconstructions Using Neural Implicit Representations in k-Space

Spieker, V., Huang, W., Eichhorn, H., Stelter, J., Weiss, K., Zimmer, V. A., Braren, R. F., Karampinos, D. C., Hammernik, K. & Schnabel, J. A., 2024, *Deep Generative Models - Third MICCAI Workshop, DGM4MICCAI 2023, Held in Conjunction with MICCAI 2023, Proceedings.* Mukhopadhyay, A., Oksuz, I., Engelhardt, S., Zhu, D. & Yuan, Y. (eds.). Springer Science and Business Media Deutschland GmbH, p. 183-192 10 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 14533 LNCS).

Learning Physics-Inspired Regularization for Medical Image Registration with Hypernetworks

Reithmeir, A., Schnabel, J. A. & Zimmer, V. A., 2024, *Medical Imaging 2024: Image Processing.* Colliot, O. & Mitra, J. (eds.). SPIE, 129262K. (Progress in Biomedical Optics and Imaging - Proceedings of SPIE; vol. 12926).

Physics-Informed Deep Learning for Motion-Corrected Reconstruction of Quantitative Brain MRI

Eichhorn, H., Spieker, V., Hammernik, K., Saks, E., Weiss, K., Preibisch, C. & Schnabel, J. A., 2024, *Medical Image Computing and Computer Assisted Intervention – MICCAI 2024 - 27th International Conference, Proceedings.* Linguraru, M. G., Dou, Q., Feragen, A., Giannarou, S., Glocker, B., Lekadir, K. & Schnabel, J. A. (eds.). Springer Science and Business Media Deutschland GmbH, p. 562-571 10 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 15007 LNCS).

Self-supervised k-Space Regularization for Motion-Resolved Abdominal MRI Using Neural Implicit k-Space Representations

Spieker, V., Eichhorn, H., Stelter, J. K., Huang, W., Braren, R. F., Rueckert, D., Sahli Costabal, F., Hammernik, K., Prieto, C., Karampinos, D. C. & Schnabel, J. A., 2024, *Medical Image Computing and Computer Assisted Intervention – MICCAI 2024 - 27th International Conference, Proceedings.* Linguraru, M. G., Dou, Q., Feragen, A., Giannarou, S., Glocker, B.,

Lekadir, K. & Schnabel, J. A. (eds.). Springer Science and Business Media Deutschland GmbH, p. 614-624 11 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 15007 LNCS).

Sparse Annotation Strategies for Segmentation of Short Axis Cardiac MRI

Stein, J., Di Folco, M. & Schnabel, J. A., 2024, *Statistical Atlases and Computational Models of the Heart. Regular and CMRxRecon Challenge Papers - 14th International Workshop, STACOM 2023, Held in Conjunction with MICCAI 2023, Revised Selected Papers.* Camara, O., Puyol-Antón, E., Suinesiaputra, A., Young, A., Sermesant, M., Tao, Q. & Wang, C. (eds.). Springer Science and Business Media Deutschland GmbH, p. 66-76 11 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 14507 LNCS).

Towards Generalised Neural Implicit Representations for Image Registration

Zimmer, V. A., Hammernik, K., Sideri-Lampretsa, V., Huang, W., Reithmeir, A., Rueckert, D. & Schnabel, J. A., 2024, *Deep Generative Models - Third MICCAI Workshop, DGM4MICCAI 2023, Held in Conjunction with MICCAI 2023, Proceedings.* Mukhopadhyay, A., Oksuz, I., Engelhardt, S., Zhu, D. & Yuan, Y. (eds.). Springer Science and Business Media Deutschland GmbH, p. 45-55 11 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 14533 LNCS).

Fast fetal head compounding from multi-view 3D ultrasound

Wright, R., Gomez, A., Zimmer, V. A., Toussaint, N., Khanal, B., Matthew, J., Skelton, E., Kainz, B., Rueckert, D., Hajnal, J. V. & Schnabel, J. A., Oct 2023, In: Medical Image Analysis. 89, 102793.

Transformer-based biomarker prediction from colorectal cancer histology: A large-scale multicentric study

TransSCOT consortium, 11 Sept 2023, In: CANCER CELL. 41, 9, p. 1650-1661.e4

Single-Modality Supervised Joint PET-MR Image Reconstruction

Corda-D'Incan, G., Schnabel, J. A., Hammers, A. & Reader, A., 1 Sept 2023, In: IEEE Transactions on Radiation and Plasma Medical Sciences. 7, 7, p. 742-754 13 p.

Graph matching and registration

Sotiras, A., Heinrich, M., Schnabel, J. & Paragios, N., 1 Jan 2023, *Medical Image Analysis.* Elsevier, p. 303-329 27 p.

Placenta segmentation in ultrasound imaging: Addressing sources of uncertainty and limited field-of-view

Zimmer, V. A., Gomez, A., Skelton, E., Wright, R., Wheeler, G., Deng, S., Ghavami, N., Lloyd, K., Matthew, J., Kainz, B., Rueckert, D., Hajnal, J. V. & Schnabel, J. A., Jan 2023, In: Medical Image Analysis. 83, 102639.

Bias in Unsupervised Anomaly Detection in Brain MRI

Bercea, C. I., Puyol-Antón, E., Wiestler, B., Rueckert, D., Schnabel, J. A. & King, A. P., 2023, *Clinical Image-Based Procedures, Fairness of AI in Medical Imaging, and Ethical and Philosophical Issues in Medical Imaging - 12th International Workshop, CLIP 2023 1st International Workshop, FAIMI 2023 and 2nd International Workshop, EPIMI 2023, Proceedings.* Wesarg, S., Oyarzun Laura, C., Puyol Antón, E., King, A. P., Baxter, J. S. H., Erdt, M., Drechsler, K., Freiman, M., Chen, Y., Rekik, I., Eagleson, R., Feragen, A., Cheplygina, V., Ganz-Benjaminsen, M., Ferrante, E., Glocker, B., Moyer, D. & Petersen, E. (eds.). Springer Science and Business Media Deutschland GmbH, p. 122-131 10 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 14242 LNCS).

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F2FD: Fourier Perturbations for Denoising Cryo-Electron Tomograms and Comparison to Established Approaches

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Evolving polarisation of infiltrating and alveolar macrophages in the lung during metastatic progression of melanoma suggests CCR1 as a therapeutic target
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Evaluation of a Linear Measurement Tool in Virtual Reality for Assessment of Multimodality Imaging Data-A Phantom Study
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Improved 3D tumour definition and quantification of uptake in simulated lung tumours using deep learning
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Medical image analysis on left atrial LGE MRI for atrial fibrillation studies: A review
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AtrialJSQnet: A New framework for joint segmentation and quantification of left atrium and scars incorporating spatial and shape information
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PRETUS: A plug-in based platform for real-time ultrasound imaging research
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Automated Quality Controlled Analysis of 2D Phase Contrast Cardiovascular Magnetic Resonance Imaging

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A variational Bayesian method for similarity learning in non-rigid image registration

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