

Prof. Dr. Bernhard Kainz

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Areas of expertise

human-in-the-loop computing, machine learning, medical image analysis, parallel algorithms

Employment history

Professor, Head of Dept. AIBE, Friedrich-Alexander-University Erlangen-Nürnberg, DE	since 09/2021
Assoc. Prof. (UK Reader), Dept. Computing, Imperial College London, UK	since 09/2021
Assoc. Prof. (UK Senior Lecturer), Dept. Computing, Imperial College London, UK	09/2019 – 08/2021
Ass. Prof. (UK Lecturer), Dept. Computing, Imperial College London, UK	10/2015 – 08/2019
Honorary Lecturer, ISBE, King's College London, UK	since 10/2015
Senior Research Fellow, ISBE, King's College London, UK	05/2015 – 10/2015
Marie-Curie Fellow, Department of Computing, Imperial College London, UK	03/2013 – 04/2015
Post-doctoral researcher, ICG, Graz University of Technology, AUT	05/2011 – 02/2013
Research Associate, ICG, Graz University of Technology, AUT	01/2008 – 04/2011
Research Associate, Dept. Urology, Medical University of Innsbruck, AUT	06/2007 – 12/2007
part-time Research Engineer, Test-lab for High-Voltage Engineering, Graz, AUT	06/2006 – 02/2013
part-time Research Engineer, Siemens Healthcare, Graz, AUT	2004 – 2007

Education

Ph.D. Graz University of Technology	10/2007 – 05/2011
Dissertation: "Ray-Based Image Generation For Advanced Medical Applications" (Advisor: Prof. Dieter Schmalstieg) (summa cum laude). Viva date: 05/25/2011	
M.Sc. Graz University of Technology (summa cum laude)	10/2005 – 10/2007
Specialization in Biomedical Engineering and Computer Vision/Graphics	
B.Sc. Graz University of Technology	10/2001 – 06/2005
Course: Telematics (Computer Science plus Electrical Engineering)	

Academic achievement summary

- ERC Consolidator Grant 2022: MIA-Normal
- 65 peer reviewed articles in scientific journals
- 77 peer reviewed full papers at leading international conferences
- 3 patents
- 20 grants, > €3.9M (as PI), > €25.2M (total)
- 28 awards, prizes, and honours
- 3 books edited
- publications: <https://scholar.google.com/citations?user=Igxq-YEAAAAJ&hl=en&oi=ao>
- graduated 8, supervising 10 PhD students
- graduated 140+ UG project students

Awards and Prizes (selected)

- **2022** Best paper runner-up MICCAI UNSURE (Ouyang et al.)
- **2022** Winner MICCAI FETA Challenge (Li et al.)
- **2021** Best Paper Award MICCAI MLCN (with Ma et al.)
- **2021** Best Demonstration runner-up MICCAI ASMUS (with ThinkSono Ltd.)
- **2021** IEEE TMI Distinguished Reviewer Award
- **2020** Winner of the MICCAI Medical Out-of-Distribution Analysis Challenge (with Tan et al.)
- **2019** Imperial President's award (team award for BioMedIA with D. Rueckert, B. Glocker, W. Bai)
- **2018** S.M. Perren research award (for Verbruggen et al. 2018, J Biomechanics)
- **2017** Winning team of the Multimodal Brain Tumor Segmentation Challenge (BraTS'17) (Kamnitsas et al.).
- **2017** IEEE PacivicVIS'17 best paper honourable mention award.
- **2017–now** Various student project prizes, Google poster competitions, Corporate Partnership Awards.
- **2016** Insight-Award for the most aesthetic Visualization 2016: "Smoky hurricane" led by R. Khlebnikov.
- **2015** Short-listed for the Nurturing Research Talents Marie Skłodowska-Curie actions prize.
- **2014** Best paper honorable mention award EuroGraphics 2014.
- **2013** Short-listed for the OCG Heinz Zemanek Price.
- **2013** *Best poster* honorable mention for IEEE SciVis 2013.
- **2012** VCBM Karl-Heinz-Höhne 3rd award for "Crepuscular Rays for Tumor Accessibility Planning".
- **2012** Short-listed for the GI-dissertation price.
- **2011** "Forum Technology and Society" and Ing. F. Schmiedl research prize dissertation prize.
- **2011** *Best paper award*, International Symposium on Non-Photorealistic Animation and Rendering.

Professional Activities past 5 years

Chair MICCAI Advances in Simplifying Medical UltraSound (ASMUS)	2023
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Nomination for the MICCAI Society Board	2021
Area Chair 21-23rd and 25-26h MICCAI	2018 – 2023
Associate Editor IEEE Transactions on Medical Imaging	since 2019
IPC Human-Centric Machine Learning @ NeurIPS	2019
Guest Editor Computers & Graphics, Visual Computing for Biology and Medicine	2019
IPC OAGM/AAPR Medical Image Analysis 2018	2018
General Chair RAMBO Intl. Workshop at MICCAI	2016 – 2018
Senior IPC: International Joint Conference on Artificial Intelligence	2017 – 2020
Paper Chair Visual Computing for Biology and Medicine (EG VCBM)	2017

Current teaching

FAU: Four courses from programming to advanced machine learning (~400 students/term)	since 2021
Imperial: Computer Graphics (~60-130 students/term),	since 2014
Imperial: Deep Learning (~180–300 students/term)	since 2019

Past teaching

Computer Architecture (~130 students/term), Matlab 101, Computing Topics, (lecture and lab)	2015 – 2019
Computer Graphics at Peking University Summer School International (~40 students)	07.2016
various courses, co-delivered lectures and labs, TUG	2007 – 2013

Funded research projects	MM/YY	funder	total/employer	type	role
MIA-NORMAL	09/23 – 06/28	ERC	€2M	Research	PI
end-to-end MRI	01/23 – 12/25	DFG	€350k	Research	Co-I
major equipment grant	12/22 – 12/24	DFG	€333k	Research	PI
Ultromics AI4Health CDT PI	10/20 – 09/24	Ultromics	UKRI	£150k	Research
iFind techn. accelerator	10/20 – 09/22	Wellcome Trust	£500k	Translation	Col
Imperial-TUM PhDs	01/20 – 09/24	Imperial-TUM	£177k	Research	PI
AI4Health EP/S011579/1	04/19 – 10/27	UK UKRI	£15M	PhD Training	Col
joint venture with JKU	10/18 – 10/21	Upper Austria	£200k	Research	PI
Imaging & AI (19923)	12/18 – 11/21	Innovate UK	£10M/1.7M	Research	Col
EP/S013687/1	04/19 – 03/22	UK EPSRC	£852k/770k	Research	PI
Intel AI DevCloud	08/18 – 08/19	Intel	\$20k	Research	PI
Impact acceleration grant	07/18 – 08/19	UK EPSRC	£12k	Translation	PI
EP/N024494/1	09/16 – 08/17	UK EPSRC	£120k	Research	PI
Wellcome/EPSRC (102431)	01/16 – 09/22	Wellcome Trust	£5M/800k	Research	Col
ClinicImpact (610886)	02/14 – 01/15	EU FP7	€3M/400k	Research	Co-Appl.
F.A.U.S.T. - (325661)	05/13 – 04/15	EU FP7	€230k	Fellowship	PI
Schrödinger Scholarship	resigned for ↑	Austrian FWF	€150k	Fellowship	PI
GOSMART (600641)	04/13 – 03/16	EU FP7	€4M/600k	Research	Co-Appl.
MVP (P23329)	09/11 – 08/14	FWF	€350k	Research	Col
PhD student funding	2015–2028	various	~£1M	12×studentships	PI

Memberships of professional bodies

Academic Fellow at the Data Science Institute at Imperial College London	since 2017
Institute of Electrical and Electronics Engineers (IEEE) - Senior Member	since 2009
Medical Image Computing and Computer Assisted Intervention (MICCAI) Society	since 2008

Selected public engagement activities/developing others

- **2017 – 2021:** <http://corticalexplorer.com>, <http://ratchet.lucidifai.com/> <http://kidneycaliper.lucidifai.com/> <http://ibd.lucidifai.com/> – public imaging demos
- **2015 – 2018:** Imperial Festival and Imperial Fringe, presented and coordinated a team of 4-9; >15,000 audience each year; festivals are each 3 days.

Consulting and advising (selected)

- **since 2023:** Fraiya.com (ultrasound image analysis technology) – Scientific Advisor and Co-founder
- **since 2021:** Compath.co.uk (histopathology image analysis technology) – Sci. Advisor and Co-founder
- **since 2020:** cydarmedical.com (interventional technology) – Scientific Advisor
- **since 2017:** Thinksono.com (diagnostic technology) – Scientific Advisor
- **2019–2020:** Ultromics.com (diagnostic technology) – Scientific Advisor

1 List of Publications

1.1 Contributions from 2020/21 to date

Peer reviewed Q1 (scimagojr.com) journal papers:

1. Day, T. G., Simpson, J. M., Razavi, R., & Kainz, B. (2023). Improving image labelling quality. *Nature Machine Intelligence*, 5(4), 335-336.
2. Wright, R., Gomez, A., Zimmer, V.A., Toussaint, N., Khanal, B., Matthew, J., Skelton, E., Kainz, B., Rueckert, D., Hajnal, J.V. and Schnabel, J.A., 2023. Fast fetal head compounding from multi-view 3D ultrasound. *Medical Image Analysis*, p.102793.
3. Avgerinos, E., Oppenheimer, J., Al-Noor, F., Karimaghaei, R., Adler, A., Singöhl, S., Kainz, B., Mandegaran, R., Heinrich, M., Spiliopoulos, S. and Geroulakos, G., 2023. Remote Expert Deep Venous Thrombosis Triaging of Novice-User Compression Sonography with Artificial Intelligence Guidance. *Journal of Vascular Surgery: Venous and Lymphatic Disorders*, 11(2), p.449.
4. Day, T.G., Kainz, B., Razavi, R. and Simpson, J., 2023. RE: Wang et al. Diagnosis of fetal total anomalous pulmonary venous connection based on the post-left atrium space ratio using artificial intelligence. *Prenatal Diagnosis*, 43(3), pp.400-401.
5. Vlontzos, A., Kainz, B. and Gilligan-Lee, C.M., 2023. Estimating categorical counterfactuals via deep twin networks. *Nature Machine Intelligence*, 5(2), pp.159-168.
6. Zimmer, V.A., Gomez, A., Skelton, E., Wright, R., Wheeler, G., Deng, S., Ghavami, N., Lloyd, K., Matthew, J., Kainz, B. and Rueckert, D., 2023. Placenta segmentation in ultrasound imaging: Addressing sources of uncertainty and limited field-of-view. *Medical Image Analysis*, 83, p.102639.
7. Ma, Q., Li, L., Robinson, E.C., Kainz, B., Rueckert, D. and Alansary, A., 2022. CortexODE: Learning Cortical Surface Reconstruction by Neural ODEs. *IEEE Transactions on Medical Imaging*.
8. Zimmerer, D., Full, P.M., Isensee, F., Jäger, P., Adler, T., Petersen, J., Köhler, G., Ross, T., Reinke, A., Kascenas, A. and Jensen, B.S., 2022. MOOD 2020: A public Benchmark for Out-of-Distribution Detection and Localization on medical Images. *IEEE Transactions on Medical Imaging*, 41(10), pp.2728-2738.
9. Liu, T., Meng, Q., Huang, J.J., Vlontzos, A., Rueckert, D. and Kainz, B., 2022. Video summarization through reinforcement learning with a 3D spatio-temporal u-net. *IEEE Transactions on Image Processing*, 31, pp.1573-1586.
10. Dou, Q., So, T.Y., Jiang, M., Liu, Q., Vardhanabhuti, V., Kaissis, G., Li, Z., Si, W., Lee, H.H., Yu, K. and Feng, Z., Dong, L., Burian, E., Jungmann, F., Braren, R., Makowski, M., Kainz, B., Rueckert, D., Glocker, B., Yu, SCH, Heng, PA, 2021. Federated deep learning for detecting COVID-19 lung abnormalities in CT: a privacy-preserving multinational validation study. *NPJ digital medicine*, 4(1), p.60.
11. Matthew J, Skelton E, Day TG, Zimmer VA, Gomez A, Wheeler G, Toussaint N, Liu T, Budd S, Lloyd K, Wright R. Exploring a new paradigm for the fetal anomaly ultrasound scan: Artificial intelligence in real time. *Prenatal diagnosis*. 2022 Jan;42(1):49-59.
12. Kainz, B., Heinrich, M.P., Makropoulos, A., Oppenheimer, J., Mandegaran, R., Sankar, S., Deane, C., Mischkewitz, S., Al-Noor, F., Rawdin, A.C. and Ruttloff, A., 2021. Non-invasive diagnosis of deep vein thrombosis from ultrasound imaging with machine learning. *NPJ Digital Medicine*, 4(1), p.137.
13. Budd, S., Robinson, E.C. and Kainz, B., 2021. A survey on active learning and human-in-the-loop deep learning for medical image analysis. *Medical Image Analysis*, 71, p.102062.
14. Day, T.G., Kainz, B., Hajnal, J., Razavi, R. and Simpson, J.M., 2021. Artificial intelligence, fetal echocardiography, and congenital heart disease. *Prenatal Diagnosis*, 41(6), pp.733-742.

Other peer reviewed journals:

1. Gomez, A., Zimmer, V.A., Wheeler, G., Toussaint, N., Deng, S., Wright, R., Skelton, E., Matthew, J., Kainz, B., Hajnal, J. and Schnabel, J., 2022. PRETUS: A plug-in based platform for real-time ultrasound imaging research. *SoftwareX*, 17, p.100959.
2. Vlontzos, A., Rueckert, D., Kainz, B., A Review of Causality for Learning Algorithms in Medical Image Analysis. *Melba Journal Volume 1 November 2022 issue 2022:028*
3. Tan, J., Hou, B., Batten, J., Qui, H., Kainz, B., Detecting Outliers with Foreign Patch Interpolation, *Melba Journal Volume 1 April 2022 issue 2022:013*
4. Grzech, D., Azampour, MF, Qiu, H., Glocker, B., Kainz, B., Le Folgoc, L., Uncertainty quantification in

non-rigid image registration via stochastic gradient Markov chain Monte Carlo, *Melba Journal* Volume 1 UNSURE2020 special issue 2021:016

5. Chotzoglou, E., Day, T., Tan, J., Matthew, J., Lloyd, D., Razavi, R., Simpson, J., Kainz, B., Learning normal appearance for fetal anomaly screening: Application to the unsupervised detection of Hypoplastic Left Heart Syndrome. *Melba Journal* Volume 1 September 2021 issue 2021:012

Peer reviewed full papers at scientific conferences:

1. Baugh, M., Tan, J., Müller, J., Dombrowski, M., Batten, J., and Kainz, B., Many tasks make light work: Learning to localise medical anomalies from multiple synthetic tasks. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2023: 26th International Conference*, Vancouver, Canada, to appear, 2023. Springer, 2023. (early accept rate < 10%)
2. Reynaud, H., Qiao, M., Dombrowski, M., Day, T., Razavi, R., Gomez, A., Leeson, P., and Kainz, B., Feature-conditioned cascaded video diffusion models for precise echocardiogram synthesis. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2023: 26th International Conference*, Vancouver, Canada, to appear, 2023. Springer, 2023 (early accept rate < 10%)
3. Schmidtke, L., Hou, B., Vlontzos, A. and Kainz, B., 2023, February. Self-supervised 3D Human Pose Estimation in Static Video via Neural Rendering. In *Computer Vision–ECCV 2022 Workshops: Tel Aviv, Israel, October 23–27, 2022, Proceedings, Part III* (pp. 704-713). Cham: Springer Nature Switzerland.
4. Schlüter, H.M., Tan, J., Hou, B. and Kainz, B., 2022, October. Natural synthetic anomalies for self-supervised anomaly detection and localization. In *Computer Vision–ECCV 2022: 17th European Conference, Tel Aviv, Israel, October 23–27, 2022, Proceedings, Part XXXI* (pp. 474-489). Cham: Springer Nature Switzerland. (acceptance rate 28%)
5. Tan, J., Kart, T., Hou, B., Batten, J. and Kainz, B., 2022. Metadetector: Detecting outliers by learning to learn from self-supervision. In *Biomedical Image Registration, Domain Generalisation and Out-of-Distribution Analysis: MICCAI 2021 Challenges: MIDOG 2021, MOOD 2021, and Learn2Reg 2021, Held in Conjunction with MICCAI 2021, Strasbourg, France, September 27–October 1, 2021, Proceedings* (pp. 119-126). Cham: Springer International Publishing
6. Li, L., Ma, Q., Li, Z., Ouyang, C., Zhang, W., Price, A., Kyriakopoulou, V., Grande, L.C., Makropoulos, A., Hajnal, J. and Rueckert, D., 2022, December. Fetal Cortex Segmentation with Topology and Thickness Loss Constraints. In *Ethical and Philosophical Issues in Medical Imaging, Multimodal Learning and Fusion Across Scales for Clinical Decision Support, and Topological Data Analysis for Biomedical Imaging: 1st International Workshop, EPIMI 2022, 12th International Workshop, ML-CDS 2022, 2nd International Workshop, TDA4BiomedicalImaging, Held in Conjunction with MICCAI 2022, Singapore, September 18–22, 2022, Proceedings* (pp. 123-133). Cham: Springer Nature Switzerland.
7. Reynaud, H., Vlontzos, A., Dombrowski, M., Gilligan Lee, C., Beqiri, A., Leeson, P. and Kainz, B., 2022, September. D’artagnan: Counterfactual video generation. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2022: 25th International Conference, Singapore, September 18–22, 2022, Proceedings, Part VIII* (pp. 599-609). Cham: Springer Nature Switzerland. (acceptance rate 30%)
8. Lebbos, C., Barcroft, J., Tan, J., Müller, J., Baugh, M., Vlontzos, A., Saso, S. and Kainz, B., 2022, September. Adnexal Mass Segmentation with Ultrasound Data Synthesis. In *Simplifying Medical Ultrasound: Third International Workshop, ASMUS 2022, Held in Conjunction with MICCAI 2022, Singapore, September 18, 2022, Proceedings* (pp. 106-116). Cham: Springer International Publishing.
9. Baugh, M., Tan, J., Vlontzos, A., Müller, J.P. and Kainz, B., 2022, September. nnOOD: A Framework for Benchmarking Self-supervised Anomaly Localisation Methods. In *Uncertainty for Safe Utilization of Machine Learning in Medical Imaging: 4th International Workshop, UNSURE 2022, Held in Conjunction with MICCAI 2022, Singapore, September 18, 2022, Proceedings* (pp. 103-112). Cham: Springer Nature Switzerland.
10. Ouyang, C., Wang, S., Chen, C., Li, Z., Bai, W., Kainz, B. and Rueckert, D., 2022, September. Improved post-hoc probability calibration for out-of-domain MRI segmentation. In *Uncertainty for Safe Utilization of Machine Learning in Medical Imaging: 4th International Workshop, UNSURE 2022, Held in Conjunction with MICCAI 2022, Singapore, September 18, 2022, Proceedings* (pp. 59-69). Cham: Springer Nature Switzerland.
11. Reinke, A., Maier-Hein, L., Christodoulou, E., Glocker, B., Scholz, P., Isensee, F., Kleesiek, J., Kozubek,

- M., Reyes, M., Riegler, M.A. and Wiesenfarth, M., 2022. Metrics Reloaded-A new recommendation framework for biomedical image analysis validation. In *Medical Imaging with Deep Learning*.
12. Grzech, D., Azampour, M.F., Glocker, B., Schnabel, J., Navab, N., Kainz, B. and Le Folgoc, L., 2022. A variational Bayesian method for similarity learning in non-rigid image registration. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 119-128). (acceptance rate 25%)
 13. Li, L., Sinclair, M., Makropoulos, A., Hajnal, J.V., David Edwards, A., Kainz, B., Rueckert, D. and Alansary, A., 2021. CAS-Net: conditional atlas generation and brain segmentation for fetal MRI. In *Uncertainty for Safe Utilization of Machine Learning in Medical Imaging, and Perinatal Imaging, Placental and Preterm Image Analysis: 3rd International Workshop, UNSURE 2021, and 6th International Workshop, PIPPI 2021, Held in Conjunction with MICCAI 2021, Strasbourg, France, October 1, 2021, Proceedings 3* (pp. 221-230). Springer International Publishing.
 14. Ma, Q., Robinson, E.C., Kainz, B., Rueckert, D. and Alansary, A., 2021. PIALNN: a fast deep learning framework for cortical pial surface reconstruction. In *Machine Learning in Clinical Neuroimaging: 4th International Workshop, MLCN 2021, Held in Conjunction with MICCAI 2021, Strasbourg, France, September 27, 2021, Proceedings 4* (pp. 73-81). Springer International Publishing.
 15. Chartsias, A., Gao, S., Mumith, A., Oliveira, J., Bhatia, K., Kainz, B. and Beqiri, A., 2021. Contrastive learning for view classification of echocardiograms. In *Simplifying Medical Ultrasound: Second International Workshop, ASMUS 2021, Held in Conjunction with MICCAI 2021, Strasbourg, France, September 27, 2021, Proceedings 2* (pp. 149-158). Springer International Publishing.
 16. Budd, S., Day, T., Simpson, J., Lloyd, K., Matthew, J., Skelton, E., Razavi, R. and Kainz, B., 2021. Can non-specialists provide high quality gold standard labels in challenging modalities? In *Domain Adaptation and Representation Transfer, and Affordable Healthcare and AI for Resource Diverse Global Health: Third MICCAI Workshop, DART 2021, and First MICCAI Workshop, FAIR 2021, Held in Conjunction with MICCAI 2021, Strasbourg, France, September 27 and October 1, 2021, Proceedings 3* (pp. 251-262). Springer International Publishing.
 17. Tan, J., Hou, B., Day, T., Simpson, J., Rueckert, D. and Kainz, B., 2021. Detecting outliers with poisson image interpolation. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2021: 24th International Conference, Strasbourg, France, September 27–October 1, 2021, Proceedings, Part V 24* (pp. 581-591). Springer International Publishing. (acceptance rate 30%)
 18. Budd, S., Sinclair, M., Day, T., Vlontzos, A., Tan, J., Liu, T., Matthew, J., Skelton, E., Simpson, J., Razavi, R. and Glocker, B., 2021. Detecting hypo-plastic left heart syndrome in fetal ultrasound via disease-specific atlas maps. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2021: 24th International Conference, Strasbourg, France, September 27–October 1, 2021, Proceedings, Part VII 24* (pp. 207-217). Springer International Publishing.
 19. Reynaud, H., Vlontzos, A., Hou, B., Beqiri, A., Leeson, P. and Kainz, B., 2021. Ultrasound video transformers for cardiac ejection fraction estimation. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2021: 24th International Conference, Strasbourg, France, September 27–October 1, 2021, Proceedings, Part VI 24* (pp. 495-505). Springer International Publishing.
 20. Hou, B., Kaissis, G., Summers, R.M. and Kainz, B., 2021. Ratchet: Medical transformer for chest x-ray diagnosis and reporting. In *Medical Image Computing and Computer Assisted Intervention–MICCAI 2021: 24th International Conference, Strasbourg, France, September 27–October 1, 2021, Proceedings, Part VII 24* (pp. 293-303). Springer International Publishing. (acceptance rate 30%)
 21. Schmidtke, L., Vlontzos, A., Ellershaw, S., Lukens, A., Arichi, T. and Kainz, B., 2021. Unsupervised human pose estimation through transforming shape templates. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 2484-2494). (acceptance rate 25%)

Peer reviewed conference abstracts:

1. Son, J.H., Alansary, A., Rueckert, D., Kainz, B. and Hou, B., 2021. Synthesis of diabetic retina fundus images using semantic label generation. In *Medical Imaging with Deep Learning*.

Public source code and demos:

1. UVT: <https://github.com/HReynaud/UVT>
2. dartagnan: <https://github.com/HReynaud/dartagnan>
3. EchoDiffusion: <https://github.com/HReynaud/EchoDiffusion> Demo: <https://huggingface.co/>

[spaces/HReynaud/EchoDiffusionDemo](#)

4. PIALNN: <https://github.com/m-qiang/PIALNN>,
5. CortexODE: <https://github.com/m-qiang/CortexODE>.
6. Twin Causal Nets: https://github.com/thanosvlo/Twin_Causal_Nets
7. MARL-for-Anatomical-Landmark-Detection:
<https://github.com/thanosvlo/MARL-for-Anatomical-Landmark-Detection>
8. Causal-Future-Prediction-in-a-Minkowski-Space-Time:
<https://github.com/thanosvlo/Causal-Future-Prediction-in-a-Minkowski-Space-Time>
9. ShaderLabWeb: <https://github.com/bkainz/ShaderLabWeb>
10. nnOOD: <https://github.com/matt-baugh/nnOOD>

Preprints:

1. Cechnicka, S., Ball, J., Arthurs, C., Roufosse, C. and Kainz, B., 2023. Realistic Data Enrichment for Robust Image Segmentation in Histopathology. arXiv preprint arXiv:2304.09534.
2. Dombrowski, M., Reynaud, H., Müller, J.P., Baugh, M. and Kainz, B., 2023. Pay Attention: Accuracy Versus Interpretability Trade-off in Fine-tuned Diffusion Models. arXiv preprint arXiv:2303.17908.
3. Müller, J.P., Baugh, M., Tan, J., Dombrowski, M. and Kainz, B., 2023. Confidence-Aware and Self-Supervised Image Anomaly Localisation. arXiv preprint arXiv:2303.13227.
4. Reynaud, H., Qiao, M., Dombrowski, M., Day, T., Razavi, R., Gomez, A., Leeson, P. and Kainz, B., 2023. Feature-Conditioned Cascaded Video Diffusion Models for Precise Echocardiogram Synthesis. arXiv preprint arXiv:2303.12644.
5. Reinke, A., Tizabi, M.D., Baumgartner, M., Eisenmann, M., Heckmann-Nötzel, D., Kavur, A.E., Rädtsch, T., Sudre, C.H., Acion, L., Antonelli, M. and Arbel, T., 2023. Understanding metric-related pitfalls in image analysis validation. ArXiv.
6. Dombrowski, M., Reynaud, H., Baugh, M. and Kainz, B., 2022. Zero-Shot Object Segmentation through Concept Distillation from Generative Image Foundation Models. arXiv preprint arXiv:2212.14306.
7. Sarapata, G., Morinan, G., Dushin, Y., Kainz, B., Ong, J. and O’Keeffe, J., 2022. Video-based activity recognition for automated motor assessment of Parkinson’s disease.
8. Hinterreiter, A., Humer, C., Kainz, B. and Streit, M., 2022. ParaDime: A Framework for Parametric Dimensionality Reduction. arXiv preprint arXiv:2210.04582.
9. Maier-Hein, L. and Menze, B., ... 2022. Metrics reloaded: Pitfalls and recommendations for image analysis validation. arXiv. org, (2206.01653).
10. Vlontzos, A., Rueckert, D. and Kainz, B., 2022. A review of causality for learning algorithms in medical image analysis. arXiv preprint arXiv:2206.05498.
11. Vlontzos, A., Reynaud, H. and Kainz, B., 2022. Is more data all you need? a causal exploration. arXiv preprint arXiv:2206.02409.
12. Kainz, B., Makropoulos, A., Oppenheimer, J., Deane, C., Mischkewitz, S., Al-Noor, F., Rawdin, A.C., Stevenson, M.D., Mandegaran, R., Heinrich, M.P. and Curry, N., 2021. Non-invasive Diagnosis of Deep Vein Thrombosis from Ultrasound with Machine Learning. medRxiv, pp.2021-01.
13. Vlontzos, A., Kainz, B. and Gilligan-Lee, C.M., 2021. Estimating the probabilities of causation via deep monotonic twin networks. arXiv preprint arXiv:2109.01904, pp.1-10.
14. Vlontzos A, Cao Y, Schmidtke L, Kainz B, Monod A. Topological data analysis of database representations for information retrieval. arXiv preprint arXiv:2104.01672. 2021.
15. Chotzoglou, E., Day, T., Tan, J., Matthew, J., Lloyd, D., Razavi, R., Simpson, J. and Kainz, B., 2020. Learning normal appearance for fetal anomaly screening: Application to the unsupervised detection of Hypoplastic Left Heart Syndrome. arXiv preprint arXiv:2012.03679.
16. Tan, J., Hou, B., Batten, J., Qiu, H. and Kainz, B., 2020. Detecting outliers with foreign patch interpolation. arXiv preprint arXiv:2011.04197.

Patents:

1. Blood vessel obstruction diagnosis method, apparatus and system F Al-Noor, S Mischkewitz, A Makropoulos, R Tanno, B Kainz, O Oktay US Patent 11,464,477
2. Method and system for confidence estimation of a trained deep learning model A Makropoulos, B Kainz

US Patent App. 17/619,202

1.2 Contributions from 2018 to 2020/21:

Peer reviewed Q1 (scimagojr.com) journal papers:

1. Meng, Q., Matthew, J., Zimmer, V.A., Gomez, A., Lloyd, D.F.A., Rueckert, D., Kainz, B., "Mutual Information-based Disentangled Neural Networks for Classifying Unseen Categories in Different Domains: Application to Fetal Ultrasound Imaging." *IEEE Trans Med Imag* 2020
2. Miolane, N., Guigui, N., Le Brigant, A., Mathe, J., Hou, B., Thanwerdas, Y., Heyder, St., Peltre, O., Koep, N., Zaatiti, H., Hajri, H., Cabanes, Y., Gerald, Th., Chauchat, P., Shewmake, Ch., Brooks, D., Donnat, C., Kainz, B., Pennec, X., "Geomstats: A Python Package for Riemannian Geometry in Machine Learning", Editors: Francis Bach, David Blei, and Bernhard Schölkopf, To appear in *Journal of Machine Learning Research (JMLR)* 2020
3. Jiang, G., Kainz, B., "Deep Radiance Caching: Convolutional Autoencoders Deeper in Ray Tracing". *Computers & Graphics*. 2020 Oct 7. Volume 94, February 2021, Pages 22-31 (reproducibility stamp award)
4. Robinson, R., Valindria, V.V., Bai, W., Oktay, O., Kainz, B., Suzuki, H., Sanghvi, M.M., Aung, N., Paiva, J.M., Zemrak, F., Fung, K., Lukaschuk, E., Lee, A.M., Carapella, V., Kim, Y.J., Piechnik, St.K., Neubauer, St., Petersen, St.E., Page, Ch., Matthews, P.M., Rueckert, D., Glocker, B., "Automated quality control in image segmentation: application to the UK Biobank cardiovascular magnetic resonance imaging study." *Journal of Cardiovascular Magnetic Resonance*. 2019 Dec 1;21(1):18.
5. Matthew, J., Deprez, M., Uus, A., Holder, M., McCabe, L., Van Poppel, M., Skelton, E., Smith, S., Sankaran, S., Wright, R., Patkee, P.A., Kainz, B., Hajnal, J., Rutherford, M., "Syndromic craniofacial dysmorphic feature assessment in utero: potential for a novel imaging methodology with reconstructed 3D fetal MRI models." *Ultrasound in Obstetrics & Gynecology*. 2019 Oct;54:29-.
6. Meng, Q., Sinclair, M., Zimmer, V., Hou, B., Rajchl, M., Toussaint, N., Oktay, O., Schlemper, J., Gomez, A., Housden, J., Matthew, J., Rueckert, D., Schnabel, J., Kainz, B., "Weakly supervised estimation of shadow confidence maps in fetal ultrasound imaging." *IEEE Trans Med Imag*. 2019 Apr 25;38(12):2755-67.
7. Lloyd, D.F.A., Pushparajah, K., Simpson, J.M., Van Amerom, J.F., Van Poppel, M.P., Schulz, A., Kainz, B., Deprez, M., Lohezic, M., Allsop, J., Mathur, S., Bellsham-Revell, H., Vigneswaran, T., Charakida, M., Miller, O., Zidere, V., Sharland, G., Rutherford, M., Hajnal, J.V., Razavi, R., "Three-dimensional visualisation of the fetal heart using prenatal MRI with motion-corrected slice-volume registration: a prospective, single-centre cohort study." *The Lancet*. 2019 Apr 20;393(10181):1619-27.
8. Schlemper, J., Oktay, O., Schaap, M., Heinrich, M., Kainz, B., Glocker, B., Rueckert, D., "Attention gated networks: Learning to leverage salient regions in medical images." *Medical image analysis*. 2019 Apr 1;53:197-207.
9. Alansary, A., Oktay, O., Li, Y., Le Folgoc, L., Hou, B., Vaillant, G., Kamnitsas, K., Vlontzos, A., Glocker, B., Kainz, B., Rueckert, D., "Evaluating reinforcement learning agents for anatomical landmark detection." *Medical image analysis*. 2019 Apr 1;53:156-64.
10. Castro, D.C., Tan, J., Kainz, B., Konukoglu, E., Glocker, B., "Morpho-Mnist: Quantitative assessment and diagnostics for representation learning." *Journal of Machine Learning Research*. 2019;20(178):1-29.
11. Bai, W., Sinclair, M., Tarroni, G., Oktay, O., Rajchl, M., Vaillant, G., Lee, A.M., Aung, N., Lukaschuk, E., Sanghvi, M. M., Zemrak, F., Fung, K., Paiva, J.M., Carapella, V., Kim, Y.J., Suzuki, H., Kainz, B., Matthews, P.M., Petersen, St. E., Piechnik, St. K., Neubauer, St., Glocker, B., Rueckert, D., "Automated cardiovascular magnetic resonance image analysis with fully convolutional networks". *Journal of Cardiovascular Magnetic Resonance*. 2018 Dec 1;20(1):65.

Other peer reviewed journals:

1. Skelton, E., Matthew, J., Li, Y., Khanal, B., Martinez, J.C., Toussaint, N., Gupta, C., Knight, C., Kainz, B., Hajnal, J.V. and Rutherford, M., 2021. Towards automated extraction of 2D standard fetal head planes from 3D ultrasound acquisitions: A clinical evaluation and quality assessment comparison. *Radiography*, 27(2), pp.519-526.

Peer reviewed full papers at scientific conferences:

1. Hinterreiter, A., Streit, M., Kainz, B., "Projective Latent Interventions for Understanding and Fine-Tuning

- Classifiers". In *Interpretable and Annotation-Efficient Learning for Medical Image Computing 2020 at MICCAI 2020 Oct 4* (pp. 13-22), Springer, Cham. (best paper award)
2. Budd, S., Patkee, P., Baburamani, A., Rutherford, M., Robinson, E.C., Kainz, B., "Surface Agnostic Metrics for Cortical Volume Segmentation and Regression." In *3rd international workshop on machine learning in clinical neuroimaging (MLCN2020) at MICCAI 2020*, Springer, Cham. (best paper honourable mention award)
 3. Tan, J., Hou, B., Batten, J., Qiu, H., Kainz, B., "Detecting Outliers with Foreign Patch Interpolation" Medical Out-of-Distribution Analysis Challenge, *Melba Journal*, Volume 1, April 2022 issue, 2022:013, <http://medicalood.dkfz.de/web/> <https://arxiv.org/abs/2011.04197> (winning entry)
 4. Liu, T., Meng, Q., Vlontzos, A., Tan, J., Rueckert, D., Kainz, B., "Ultrasound Video Summarization Using Deep Reinforcement Learning", In *Medical Image Computing and Computer Assisted Intervention – MICCAI 2020* pp. 483-492, Springer Cham. (acceptance rate 30%)
 5. Grzech, D., Kainz, B., Glocker, B., Le Folgoc, L., "Image Registration via Stochastic Gradient Markov Chain Monte Carlo". In *Uncertainty for Safe Utilization of Machine Learning in Medical Imaging, and Graphs in Biomedical Image Analysis: Second International Workshop, UNSURE 2020 at MICCAI 2020, and Third International Workshop, GRAIL 2020, Held in Conjunction with MICCAI 2020, Lima, Peru, October 8, 2020, Proceedings* (p. 3). Springer Nature. (nurturing talented RA Le Folgoc with last author position)
 6. Vlontzos, A., Budd, S., Hou, B., Rueckert, D., Kainz, B., "3D Probabilistic Segmentation and Volumetry from 2D projection images". In *International Workshop on Thoracic Image Analysis 2020 at MICCAI 2020 Oct 8* (pp. 48-57). Springer, Cham.
 7. Meng, Q., Rueckert, D., Kainz, B., "Unsupervised Cross-domain Image Classification by Distance Metric Guided Feature Alignment." In *Medical Ultrasound, and Preterm, Perinatal and Paediatric Image Analysis 2020 at MICCAI 2020 Oct 4* (pp. 146-157). Springer, Cham.
 8. Tan, J., Au, A., Meng, Q., Finesilver-Smith, S., Simpson, J., Rueckert, D., Razavi, R., Day, T., Lloyd, D., Kainz, B., "Automated Detection of Congenital Heart Disease in Fetal Ultrasound Screening". In *Medical Ultrasound, and Preterm, Perinatal and Paediatric Image Analysis 2020 at MICCAI 2020 Oct 4* (pp. 243-252). Springer, Cham.
 9. Tan, J., Kainz, B., "Divergent search for image classification behaviors." In *Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion 2020 Jul 8* (pp. 91-92).
 10. Miolane, N., Guigui, N., Zaatiti, H., Shewmake, C., Hajri, H., Brooks, D., Le Brigant, A., Mathe, J., Hou, B., Thanwerdas, Y., Heyder, S., Peltre, O., Koep, N., Cabanes, Y., Gerald, Th., Chauchat, P., Kainz, B., Donnat, C., Holmes, S., Pennec, X., "Introduction to Geometric Learning in Python with Geomstats." In *Proceedings of the 19th Python in Science Conference 2020 Jul 6* (Vol. 2020).
 11. Hou, B., Vlontzos, A., Alansary, A., Rueckert, D., Kainz, B., "Flexible Conditional Image Generation of Missing Data with Learned Mental Maps." In *International Workshop on Machine Learning for Medical Image Reconstruction 2019 at MICCAI 2019 Oct 17* (pp. 139-150). Springer, Cham.
 12. Meng, Q., Pawlowski, N., Rueckert, D., Kainz, B., "Representation disentanglement for multi-task learning with application to fetal ultrasound." In *Smart Ultrasound Imaging and Perinatal, Preterm and Paediatric Image Analysis 2019 at MICCAI 2019 Oct 17* (pp. 47-55). Springer, Cham.
 13. Chotzoglou, E., Kainz, B., "Exploring the Relationship Between Segmentation Uncertainty, Segmentation Performance and Inter-observer Variability with Probabilistic Networks." In *Large-Scale Annotation of Biomedical Data and Expert Label Synthesis and Hardware Aware Learning for Medical Imaging and Computer Assisted Intervention 2019 at MICCAI 2019 Oct 13* (pp. 51-60). Springer, Cham.
 14. Wright, R., Toussaint, N., Gomez, A., Zimmer, V., Khanal, B., Matthew, J., Skelton, E., Kainz, B., Rueckert, D., Hajnal, J.V., Schnabel, J.A., "Complete Fetal Head Compounding from Multi-view 3D Ultrasound." In *International Conference on Medical Image Computing and Computer-Assisted Intervention 2019 at MICCAI 2019 Oct 13* (pp. 384-392). Springer, Cham. (acceptance rate 30%)
 15. Tan, J., Au, A., Meng, Q., Kainz, B., "Semi-supervised Learning of Fetal Anatomy from Ultrasound." In *Domain Adaptation and Representation Transfer and Medical Image Learning with Less Labels and Imperfect Data 2019 at MICCAI 2019 Oct 13* (pp. 157-164). Springer, Cham.
 16. Holland, R., Patel, U., Lung, P., Chotzoglou, E., Kainz, B., "Automatic detection of bowel disease with residual networks." In *International Workshop on PRedictive Intelligence In MEDicine 2019 at MICCAI*

2019 Oct 13 (pp. 151-159). Springer, Cham.

17. Budd, S., Sinclair, M., Khanal, B., Matthew, J., Lloyd, D., Gomez, A., Toussaint, N., Robinson, E.C., Kainz, B., Confident head circumference measurement from ultrasound with real-time feedback for sonographers. In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2019 Oct 13 (pp. 683-691). Springer, Cham. (acceptance rate 30%)
18. Vlontzos, A., Alansary, A., Kamnitsas, K., Rueckert, D., Kainz, B., "Multiple landmark detection using multi-agent reinforcement learning." In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2019 Oct 13 (pp. 262-270). Springer, Cham. (acceptance rate 30%)

Peer reviewed conference abstracts:

1. Ellershaw, S., Schmidtke, L., Khatib, N., Eden, J., Jones, A., Dall'Orso, S., Muceli, S., Burdet, E., Nowlan, N., Arichi, T., Kainz, B., "3D Infant Pose Estimation Using Transfer Learning", Medical Imaging meets NeurIPS 2020 (oral, acceptance rate 14%)
2. Hou, B., Kaissis, G., Summers, R., Kainz, B., "RATCHET: Medical Transformer for Chest X-ray Diagnosis and Reporting", Medical Imaging meets NeurIPS 2020
3. Chotzoglou, E., Budd, S., Day, Th., Simpson, J., Kainz, B., "Unsupervised detection of Hypoplastic Left Heart Syndrome in fetal screening", Medical Imaging meets NeurIPS 2020

Public source code and demos:

1. <https://github.com/bkainz/ShaderLabWeb> (public source code for new online teaching framework)
2. <https://github.com/einbandi/latent-projective-interventions> – source code for conference paper
3. https://github.com/Lorna-Liu/ultrasound_vsumm_RL – source code for conference paper
4. <https://github.com/jemtani/FPI> – source code for conference paper
5. <https://github.com/bkainz/fastreg> – fast registration library, source code for conference paper
6. <https://github.com/qmeng99/MetFA> – source code for conference paper
7. <https://github.com/qmeng99/Multi-task-Representation-Disentanglement> – source code for conference paper
8. <https://github.com/sambuddinc/PHiSeg-code> – source code for conference paper
9. <https://github.com/thanosvlo/MARL-for-Anatomical-Landmark-Detection> – source code for conference paper
10. <https://github.com/thanosvlo/Causal-Future-Prediction-in-a-Minkowski-Space-Time> – source code for preprint paper
11. <https://github.com/qmeng99/mutual-information-based-disentangled-neural-networks> – source code for journal paper
12. <https://github.com/geomstats/geomstats> – source code for journal paper
13. <https://osr.jstudios.ovh/index> – source code and plugins for journal paper .
14. <https://github.com/qmeng99/shadowConfidenceMap> – source code for journal paper 6
15. <https://github.com/ozan-oktay/Attention-Gated-Networks> – source code for journal paper 8
16. <https://github.com/amiralansary/rl-medical> – source code for journal paper
17. <https://github.com/dccastro/Morpho-MNIST> – source code for journal paper
18. <http://ibd.lucidifai.com> – UG group project to make machine learning algorithms accessible for clinicians
19. <http://lung.lucidifai.com/> – MEng final year project to provide a lung analyser for ongoing COVID-19 crisis
20. <http://torchmedic.lucidifai.com/> – MEng group project demo for stochastic segmentation library
21. https://play.google.com/store/apps/details?id=xyz.hutt.meng.generic&hl=en-GB&ah=FTmUe9cKkd_Rs7VpdciJLay-gJ0 – MEng demo project

Preprints:

1. Vlontzos, A., Rocha, H.B., Rueckert, D., Kainz, B., "Causal Future Prediction in a Minkowski Space-Time." arXiv preprint arXiv:2008.09154. 2020 Aug 20. (MIT tech review feature story, <https://bit.ly/35cN6rq>)

2. Budd, S., Robinson, E.C., Kainz B., "A Survey on Active Learning and Human-in-the-Loop Deep Learning for Medical Image Analysis". arXiv preprint arXiv:1910.02923. 2019 Oct 7.
3. Jiang, G., Kainz, B., "One Shot Radiance: Global Illumination Using Convolutional Autoencoders." arXiv preprint arXiv:1910.02480. 2019 Oct 6.
4. Meng, Q., Matthew, J., Zimmer, V.A., Gomez, A., Lloyd, D.F., Rueckert, D., Kainz, B., "Mutual Information-based Disentangled Neural Networks for Classifying Unseen Categories in Different Domains: Application to Fetal Ultrasound Imaging." arXiv preprint arXiv:2011.00739. 2020 Oct 30.
5. Hinterreiter, A., Streit, M., Kainz, B., "Projective Latent Space Decluttering." arXiv preprint arXiv:2006.12902. 2020 Jun 23.
6. Liu, T., Meng, Q., Vlontzos, A., Tan, J., Rueckert, D., Kainz, B., "Ultrasound Video Summarization using Deep Reinforcement Learning." arXiv preprint arXiv:2005.09531. 2020 May 19.
7. Tan, J., Kainz, B., "Divergent Search for Few-Shot Image Classification." arXiv preprint arXiv:2004.07903. 2020 Apr 16.
8. Meng, Q., Rueckert, D., Kainz, B., "Learning Cross-domain Generalizable Features by Representation Disentanglement." arXiv preprint arXiv:2003.00321. 2020 Feb 29.
9. Budd, S., Patkee, P., Baburamani, A., Rutherford, M., Robinson, E.C., Kainz, B., "Surface Agnostic Metrics for Cortical Volume Segmentation and Regression." arXiv preprint arXiv:2010.01669. 2020 Oct 4.
10. Robinson, R., Valindria, V.V., Bai, W., Oktay, O., Kainz, B., Suzuki, H., Sanghvi, M.M., Aung, N., Paiva, J., Zemrak, F., Fung, K. Paiva, J.M., Carapella, V., Kim, Y.J., Suzuki, H., Kainz, B., Matthews, P.M., Petersen, St. E., Piechnik, St. K., Neubauer, St., Glocker, B., Rueckert, D., "Automated Quality Control in Image Segmentation: Application to the UK Biobank" Cardiac MR Imaging Study. arXiv preprint arXiv:1901.09351. 2019 Jan 27.
11. Bakas, S., . . . , Kainz, B., . . . , et al. (327+ authors) "Identifying the best machine learning algorithms for brain tumor segmentation, progression assessment, and overall survival prediction in the BRATS challenge." arXiv preprint arXiv:1811.02629. 2018 Nov 5.

1.3 Contributions from 2015 to 2018:

peer reviewed Q1 (scimagojr.com) journal papers:

1. Oktay, O., Ferrante, E., Kamnitsas, K., Heinrich, M., Bai, W., Caballero, J., Cook, S. A., de Marvao, A., Dawes, T., O'Regan, D. P., Kainz, B., Glocker, B., and Rueckert, D., "Anatomically Constrained Neural Networks (ACNNs): Application to Cardiac Image Enhancement and Segmentation" IEEE Trans. Med Imag 37, (2018), 384-395.
2. Lloyd, D. F. A., van Poppel, M., Schultz, A., Pushparajah, K., Simpson, J., van Amerom, J.F.P., Kainz, B., Kuklisova-Murgasova, M., Vigneswaran, T., Charakida, M., Miller, O., Zidere, V., Sharland, G., Rutherford, M., Hajnal, J., and Razavi, R., "Motion corrected fetal cardiac MRI increases diagnostic confidence in clinically" challenging cases, Heart 104, (2018), A11–A11
3. Verbruggen, St. W., Kainz, B., Shelmerdine, S. C., Hajnal, J. V., Rutherford, M. A., Arthurs, O. J., Phillips, A. T. M., and Nowlan, N. C., "Stresses and strains on the human fetal skeleton during development", J. Royal Soc. Interface 15(138), (2018), 20170593
4. Verbruggen, S.W., Kainz, B., Shelmerdine, S.C., Arthurs, O.J., Hajnal, J.V., Rutherford, M.A., Phillips, A.T., and Nowlan, N.C., "Altered biomechanical stimulation of the developing hip joint in presence of hip dysplasia risk factors", J Biomech 78, (2018), 1 - 9
5. Hou, B., Khanal, B., Alansary, A., McDonagh, St., Davidson, A., Rutherford, M., Hajnal, J. V., Rueckert, D., Glocker, B., and Kainz, B., "3-D Reconstruction in Canonical Co-ordinate Space from Arbitrarily Oriented 2D Images", IEEE Trans Med Imag 37, (2018), 1737-1750
6. Alansary, A., Rajchl, M., McDonagh, S. G., Murgasova, M., Damodaram, M., Lloyd, D. F. A., Davidson, A., Rutherford, M., Hajnal, J. V., Rueckert, D., and Kainz, B., "PVR: Patch-to-Volume Reconstruction for Large Area Motion Correction of Fetal MRI", IEEE Trans Med Imag 36, (2017), 2031-2044
7. Miao, H., Mistelbauer, G., Karimov, A., Alansary, A., Davidson, A., Lloyd, D. F. A., Damodaram, M., Story, L., Hutter, J., Hajnal, J. V., Rutherford, M., Preim, B., Kainz, B., and Gröller, M. E., "Placenta Maps: In Utero Placental Health Assessment of the Human Fetus", IEEE Trans Vis Comput Grap 23, (2017), 1612-1623

8. Rajchl, M., Lee, M. C. H., Oktay, O., Kamnitsas, K., Passerat-Palmbach, J., Bai, W., Damodaram, M., Rutherford, M. A., Hajnal, J. V., Kainz, B., and Rueckert, D., "DeepCut: Object Segmentation From Bounding Box Annotations Using Convolutional Neural Networks", *IEEE Trans Med Imag* 36, (2017), 674-683
9. Baumgartner, C. F., Kamnitsas, K., Matthew, J., Fletcher, T. P., Smith, S., Koch, L. M., Kainz, B., and Rueckert, D., "SonoNet: Real-Time Detection and Localisation of Fetal Standard Scan Planes in Free-hand Ultrasound", *IEEE Trans Med Imag* 36, (2017), 2204-2215
10. Lloyd, D., Kainz, B., van Amerom, J. F., Lohezic, M., Pushparajah, K., Simpson, J. M., Malamateniou, Ch., Hajnal, J. V., Rutherford, M., and Razavi, R., "Prenatal MRI visualisation of the aortic arch and fetal vasculature using motion-corrected slice-to-volume reconstruction", *J Cardiovasc Magn Reson* 18, (2016), 180
11. Rueckert, D., Glocker, B., and Kainz, B., "Learning clinically useful information from images: Past, present and future", *Med Image Anal* 33, (2016), 13 - 18
12. Egger, J., Busse, H., Brandmaier, P., Seider, D., Gawlitza, M., Strocka, S., Voglreiter, P., Dokter, M., Hofmann, M., Kainz, B., Hann, A., Chen, X., Alhonnoro, T., Pollari, M., Schmalstieg, D., and Moche, M., "Interactive Volumetry Of Liver Ablation Zones", *Scientific Reports*, 5, (2015), 15373
13. Kainz, B., Steinberger, M., Wein, W., Kuklisova-Murgasova, M., Malamateniou, C., Keraudren, K., Torsney-Weir, T., Rutherford, M., Aljabar, P., Hajnal, J.V., and Rueckert, D., "Fast Volume Reconstruction From Motion Corrupted Stacks of 2D Slices", *IEEE Trans Med Imag* 34, (2015), 1901–1913 Books edited:
14. Stoyanov, D.; Taylor, Z.; Kainz, B.; Maicas, G.; Beichel, R.; Martel, A.; Maier-Hein, L.; Bhatia, K.; Vercauteren, T.; Oktay, O. T.; Carneiro O., Carneiro, G.; Bradley, A. P.; Nascimento, J.; Min, H.; Brown, M. S.; Jacobs, C.; Lassen-Schmidt, B.; Mori, K.; Petersen, J.; Estépar, R. S. J.; Schmidt-Richberg, A.; Veiga, C. (Eds.), "Image Analysis for Moving Organ, Breast, and Thoracic Images: Third International Workshop, RAMBO 2018, Fourth International Workshop, BIA 2018, and First International Workshop, TIA 2018, Held in Conjunction with MICCAI 2018, Granada, Spain, September 16 and 20, 2018, Proceedings", *Lecture Notes in Computer Science (LNCS)* 11040, (Springer International Publishing) 2018
15. Zuluaga, M. A.; Bhatia, K.; Kainz, B.; Moghari, M. H.; Pace, D. F. (Eds.), *Reconstruction, Segmentation, and Analysis of Medical Images: First International Workshops, RAMBO 2016 and HVSMR 2016, Held in Conjunction with MICCAI 2016, Athens, Greece, October 17, 2016, Revised Selected Papers, volume LNCS 10129*, (Springer International Publishing) 2017
16. Cardoso, J., Arbel, T.; Gao, F.; Kainz, B.; van Walsum, T.; Shi, K.; Bhatia, K. K.; Peter, R.; Vercauteren, T.; Reyes, M.; Dalca, A.; Wiest, R.; Niessen, W.; Emmer, B. J. (Eds.), *Molecular Imaging, Reconstruction and Analysis of Moving Body Organs, and Stroke Imaging and Treatment. Fifth International Workshop, CMMI 2017, Second International Workshop, RAMBO 2017, and First International Workshop, SWITCH 2017, Held in Conjunction with MICCAI 2017, Québec City, QC, Canada, September 14, 2017, Proceedings, volume 10555*, (Springer, Cham) 2017

Peer reviewed full papers at scientific conferences:

1. Alansary, A.; Le Folgoc, L.; Vaillant, G.; Oktay, O.; Li, Y.; Bai, W.; Passerat-Palmbach, J., Guerrero, R., Kamnitsas, K., Hou, B., McDonagh, S., Glocker, B., Kainz, B., and Rueckert, D., "Automatic View Planning with Multi-scale Deep Reinforcement Learning Agents" in *Medical Image Computing and Computer Assisted Intervention – MICCAI 2018* Frangi, A. F., Schnabel, J. A., Davatzikos, C., Alberola-Lopez, C., and Fichtinger, G. ed (Springer International Publishing) 2018, 277-285 (Proc. 21st International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2018) (acceptance rate 30%)
2. Tanno, R., Makropoulos, A., Arslan, S., Oktay, O., Mischkewitz, S., Al-Noor, F., Oppenheimer, J., Mandegaran, R., Kainz, B., and Heinrich, M., "AutoDVT: Joint Real-time Classification for Vein Compressibility Analysis in Deep Vein Thrombosis Ultrasound Diagnostics" in *Medical Image Computing and Computer Assisted Intervention – MICCAI 2018* Frangi, A. F., Schnabel, J. A., Davatzikos, C., Alberola-Lopez, C., and Fichtinger, G. ed (Springer International Publishing) 2018, 905-912 (Proc. 21st International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2018) (acceptance rate 30%)
3. Li, Y., Alansary, A., Cerrolaza, J., Khanal, B., Sinclair, M., Matthew, J., Gupta, C., Knight, C., Kainz,

- B., and Rueckert, D. "Fast Multiple Landmark Localisation Using a Patch-based Iterative Network" in Medical Image Computing and Computer Assisted Intervention – MICCAI 2018 Frangi, A. F., Schnabel, J. A., Davatzikos, C., Alberola-Lopez, C., and Fichtinger, G. ed (Springer International Publishing) 2018, 563-571 (Proc. 21st International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2018) (acceptance rate 30%)
4. Hou, B., Miolane, N., Khanal, B., Lee, M., Alansary, A., McDonagh, S., Hajnal, J., Glocker, B., Rueckert, D., and Kainz, B., "Computing CNN Loss and Gradients for Pose Estimation with Riemannian Geometry", in Medical Image Computing and Computer Assisted Intervention – MICCAI 2018 Frangi, A. F., Schnabel, J. A., Davatzikos, C., Alberola-Lopez, C., and Fichtinger, G. ed (Springer International Publishing) 2018, 756-764 (Proc. 21st International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2018) (acceptance rate 30%)
 5. Li, Y., Khanal, B., Hou, B., Alansary, A., Cerrolaza, J., Sinclair, M., Matthew, J., Gupta, C., Knight, C., Kainz, B., and Rueckert, D., "Standard Plane Detection in 3D Fetal Ultrasound Using an Iterative Transformation Network" in Medical Image Computing and Computer Assisted Intervention – MICCAI 2018 Frangi, A. F., Schnabel, J. A., Davatzikos, C., Alberola-Lopez, C., and Fichtinger, G. ed (Springer International Publishing) 2018, 392-400 (Proc. 21st International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2018) (acceptance rate 30%)
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Public source code:

1. <https://github.com/bkainz/ShaderLabFramework> Desktop Teaching framework for Computer Graphics (updated in 2018)
2. <https://github.com/bkainz/DeepPose> pose estimation with CNNs and Riemannian metrics in SE(3)
3. <https://github.com/bkainz/Attention-Gated-Networks> attention gated networks for segmentation and classification
4. <http://www.corticaexplorer.com/> outreach framework to visualise cortical brain function
5. SonoNet <https://github.com/baumgach/SonoNet-weights> framework for real-time fetal standard scan plane detection during ultrasound examinations
6. <https://github.com/bkainz/fetalReconstruction> PVR: Patch-to-Volume Reconstruction for Large Area Motion Correction of Fetal MRI
7. <https://github.com/bkainz/fetalReconstruction> GPU accelerated Motion compensation for med-

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