Antonin Sulc PhD

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Hamburg
Germany

Research Interests Anomaly Detection, Compute Vision, NLP + LLM

Technologies PyTorch, Streamlit, HuggingFace, High-Performance (Cloud) Computing, R

Languages English (C1), German (B2), Czech (native), Hangul, Ivrit

Education

University of Konstanz, Konstanz, Germany

PhD., Artificial Intelligence - Computer Vision, 2015 - 2020

- Thesis Topic: *Lightfield Analysis for non-Lambertian Scenes*
- Grade: *Magna Cum Laude* (1.0)
- Advisors: Prof. Dr. Bastian Goldluecke
- 415 Citations (Google Scholar)
- Publications on top-tier conferences (CVPR, ICCV, BMVC)
- My duties also involve supervision of students and supporting other departments in their tasks (Dpt. of Collective Behaviour)

Czech Technical University, Prague, Czech Republic

Bc., MSc., Artificial Intelligence, 2008 - 2014

- Topic: *On parametric model creation with Neural Modeling Fields*, **nominated as a master thesis of year 2014** in Czech Republic
- Advisor: Dr. Michal Vavrecka

Work History

Co-Founder April 2022 - ∞
mindling.tech
Consulting Start-up,
Development of tailor made AI solutions

Senior Data Scientist May 2021 - October 2024
Helmholtz Gemeinschaft
Real-time accelerator controls algorithms for anomaly detection
Improvement of corporate FAIR principles.

Visiting Researcher (within PhD.) March 2020 - Aug 2020
University of Haifa - Marine Imaging Lab,
A short term research stay, lead to one (oral) publication
Supervisor: Dr. Tali Treibitz

Visiting Researcher (within PhD.) Oct 2018 - March 2019
National Institute of Informatics in Tokyo,
Imari Sato Lab
A short term research stay, lead to two publications
Supervisor: Prof. Dr. Imari Sato

Software Engineer & Data Scientist Jan 2014 - Dec 2015
Vendavo Inc., Prague, Czech Republic
Development of recommender systems
Supervisor: Dr. Ludek Kopacek, Eric Bergerson

Journals

- **A. Sulc**, A. Eichler and T. Wilksen Unsupervised Log Anomaly Detection with Few Unique Tokens *IET Journal Information Security* (in review)
- **A. Sulc**, A. Eichler and T. Wilsken. A data-driven anomaly detection on SRF cavities at the European XFEL. *Journal of Physics: Conference Series*. Vol. 2420. No. 1. IOP Publishing, 2023.
- **A. Sulc**, O. Johannsen, B. Goldluecke. Recovery of Geometry, Natural Illumination and BRDF from a Single Light Field Image, In *Journal of the Optical Society of America A*, 2022,

- S. Ishihara, **A. Sulc**, and I Sato, Depth estimation using spectrally varying defocus blur, In *Journal of the Optical Society of America A*, 2021,

Peer-Reviewed Publications

1. **A. Sulc**, R. Kammering, A. Eichler, T. Wilksen PACuna: Automated Fine-Tuning of Language Models for Particle Accelerators at *ML4Physics Workshop at The Conference on Neural Information Processing Systems 2023*, New Orleans, USA
2. **A. Sulc**, I. Sato, B. Goldluecke, T. Treibitz. Towards Monocular Shape from Refraction, In BMVC, 2021, **oral (3.3% acceptance)**
3. S. Ishihara, **A. Sulc**, I. Sato. Depth from Spectral Defocus Blur. In *Proc. International Conference in Image Processing (ICIP)*, 2019
4. M. Zhu, A. Alperovich, O. Johannsen, **A. Sulc**, B. Goldluecke. An Epipolar Volume Autoencoder with Adversarial Loss for Deep Light Field Super-Resolution. In *Proc. Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, 2019.
5. **A. Sulc**, O. Johannsen, B. Goldluecke. Inverse Lightfield Rendering for Shape, Reflection and Natural Illumination. In *Proc. 11th International Conference on Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)*, 2017.
6. O. Johannsen, **A. Sulc**[1], N. Marniok, B. Goldluecke. Layered scene reconstruction from multiple light field camera views. In *Proc. Asian Conference on Computer Vision (ACCV)*, 2016.
7. **A. Sulc**, A. Alperovich, N. Marniok, B. Goldluecke. Reflection Separation in Light Fields based on Sparse Coding and Specular Flow. In *Proc. Vision, Modelling and Visualization (VMV)*, 2016.
8. O. Johannsen, **A. Sulc**, B. Goldluecke. Occlusion-aware depth estimation using sparse light field coding. In *Proc. German Conference on Computer Vision (GCPR)*, 2016.
9. O. Johannsen, **A. Sulc**, B. Goldluecke. What Sparse Light Field Coding Reveals About Scene Structure. In *Proc. Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016.
10. O. Johannsen, **A. Sulc**, B. Goldluecke. Variational Separation of Light Field Layers. In *Proc. Vision, Modelling and Visualization (VMV)*, 2015.
11. O. Johannsen, **A. Sulc**, B. Goldluecke. On Linear Structure from Motion for Light Field Cameras. In *Proc. International Conference on Computer Vision (ICCV)*, 2015.

Publications

- **A. Sulc**, P. Connor ChatQCD: Let Large Language Models Explore QCD , 42nd International Conference on High Energy Physics
- P. Connor, **A. Sulc** Revealing Connections in QCD with Machine Learning , 42nd International Conference on High Energy Physics
- **A. Sulc**, A. Eichler, T. Wilksen, Automated Anomaly Detection on European XFEL Klystrons at *International Conference in Particle Accelerators 2024*, Nashville, USA
- **A. Sulc**, A. Eichler, G. Hartmann, T. Wilksen, J. St. John, F. Mayet, J. Maldonado, D. Ratner, J. Kaiser, V. Kain, T. Hellert, H. Hoschouer, Towards Unlocking Insights from Logbooks Using AI at *International Conference in Particle Accelerators 2024*, Nashville, USA
- **A. Sulc**, A. Eichler, T. Wilksen, Log Anomaly Detection on EuXFEL Nodes at *The 19th Biennial International Conference on Accelerator and Large Experimental Physics Control Systems*, Cape Town, South Africa, **oral**
- **A. Sulc**, A. Eichler, T. Wilksen Textual Analysis of ICALEPCS and IPAC Conference Proceedings: Revealing Research Trends, Topics, and Collaborations for Future Insights and Advanced Search at *The 19th Biennial International Conference on Accelerator and Large Experimental Physics Control Systems*, Cape Town, South Africa,**oral**
- **A. Sulc**, O. R. Kammering, T. Wilksen. A Data-Driven Beam Trajectory Monitoring at the European XFEL at *International Conference in Particle Accelerators 2022*, Bangkok, Thailand

[1] Equal Contribution

Talks and Tutorials

1. Exploring the Strong Coupling Through Natural Language Processing at *1st Large Language Models in Physics Symposium (LIPS)*
2. Illuminating the Dark: Discovering in Dark Matter Research through Natural Language Processing at *1st Large Language Models in Physics Symposium (LIPS)*
3. Unlocking Insights from Logbooks using AI at DESY and BESSY at *9th Low Emittance Rings Workshop 2024*
4. Towards Unlocking Insights from Logbooks using AI at DESY and BESSY at *4th ICFA Beam Dynamics Mini-Workshop on Machine Learning for Particle Accelerators*
5. A Potential of Use of Language Processing in Accelerator Control Systems at *International Conference on Accelerator and Large Experimental Physics Control Systems 2023 in Cape Town, South Africa*
6. Machine Learning for Accelerator(s) R&D at *Any Light Particle Search Workshop at DESY in Hamburg, Germany*
7. Tutorial on Anomaly Detection at *ICFA Beam Dynamics Workshop in Chicago, IL, USA*
8. Current Development of Automated Accelerator Controls at *DESY 8th Matter and Technologies Annual Meeting in Hamburg, Germany*
9. Machine Learning for Anomaly Detection at *MLE-Summer School at TUHH in Hamburg, Germany*
10. Data-Driven Diagnosis at European XFEL at *CDCS Opening Symposium in Hamburg, GErmany*
11. Light Field Analysis for non-Lambertian Scenes at *PixelClub - Technion in Haifa, Israel*
12. Multiobject Tracking Repetitive Patterns with Autoencoder at *Machine learning in the behavioral sciences Workshop at ASAB Summer School 2019 in Konstanz, Germany*
13. Lightfield Analysis for non-Lambertian Scenes at *The 11th Intelligent Machine Perception Seminar in Prague, Czech Republic*
14. Light-fields: Beyond the Lambertian at *The 38th Pattern Recognition and Computer Vision Colloquium in Prague, Czech Republic*
15. State-of-The-Art Computational Design and Fabrication

Other

- Scientific Chair of 5th ICFA Beam Dynamics Mini-Workshop on Machine Learning for Particle Accelerators.
- B-driver license.