Denys Rozumnyi

Curriculum Vitae

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Education

Sep 2019 – Present **ETH Zurich**, *PhD Student*, Supervisor: Prof Marc Pollefeys, Computer Vision and Geometry Group, Zurich, Switzerland.

Jul 2022 **International Computer Vision Summer School (ICVSS)**, Sicily, Italy.

Jul 2017 – Jun 2019 **Czech Technical University in Prague**, *Master of Science (**with honours**)*, Specialisation: Computer Vision and Image Processing, Minor Specialisation: Artificial Intelligence, Average grade: 1.10/1.00, 11th best graduate of the Faculty of Electrical Engineering.

Oct 2018 – Mar 2019 **Technical University of Munich**, *Erasmus+ Student Exchange Programme*, Master of Science in Computer Science.

Sep 2014 – Jun 2017 **Czech Technical University in Prague**, *Bachelor of Science (**with honours**)*, Specialisation: Computer Science, Minor Specialisation: Mathematics. Average grade: 1.08/1.00, 2nd best graduate of the Faculty of Electrical Engineering.

Sep 2016 – Jan 2017 **Swansea University, Wales, United Kingdom**, *Erasmus+ Student Exchange Programme*, *Bachelor of Science in Computer Science*.

Aug 2015 **Vision and Sports Summer School**, Prague, Czech Republic.

Work experience

Sep 2019 – Present **Research Assistant**, ***Computer Vision and Geometry Group***, ETH Zurich, Switzerland.
Topic: Object-centric 3D reconstruction, tracking, and deblurring. [8,9,10,11,13]. Supervisor: Prof Marc Pollefeys. Close collaborators: Prof Martin Oswald, Prof Jiri Matas, Prof Vittorio Ferrari.

Oct 2023 – Mar 2024 **PhD Research Scientist Intern**, **Meta Zurich**, Switzerland.
Collaborators: Robin Kips, Nadine Rüegg, Artsiom Sanakoyeu, Othman Sbai, Yuhua Chen. Resulted in a submission [20]

Oct 2022 – Jul 2023 **PhD Student Researcher**, **Google Zurich**, Switzerland.
Supervisors: Prof Vittorio Ferrari, Stefan Popov. Resulted in a NeurIPS 2023 paper [17].

Mar 2018 – Present **Research Fellow**, ***Centre for Machine Perception***, CTU in Prague, Czech Republic.
Topic: Tracking exploiting blur [6,7,8,10,12]. Supervisor: Prof Jiří Matas.

Jul 2018 – Aug 2018 **Student Summer Research Fellowship**, ***ETH Zurich***, Zurich, Switzerland, accepted 15 students out of 1400 applications worldwide (acceptance rate around 1%).
Topic: Semantic 3D reconstruction [5]. Supervisors: Prof Marc Pollefeys, Dr. Martin Oswald.

Aug, Sep 2017 **Summer Internship**, ***Tampere University of Technology***, Tampere, Finland.
Topic: Creating real-time demo in C++ for fast moving objects detection: `https://github.com/rozumden/fmo-cpp-demo`. Supervisors: Prof Jiří Matas, Prof Joni Kämäräinen.

Sep 2016 – Feb 2018 **Research Intern**, ***Centre for Machine Perception***, CTU in Prague, Czech Republic.
Topic: Detection and tracking of fast moving objects [2]. Supervisor: Prof Jiří Matas.

Jul 2016 – Aug 2016 **Summer Internship**, ***Tampere University of Technology***, Tampere, Finland.
Topic: Detection and tracking of fast moving objects [2]. Supervisor: Prof Jiří Matas.

Sep 2014 – Jun 2016 **Research Intern**, ***Centre for Machine Perception***, CTU in Prague, Czech Republic.
Topic: Coplanar repeated patterns detection in images [1]. Supervisors: James Pritts, Prof'. Ondřej Chum.

Awards

Feb 2021 **The Edwards Award**, 2nd place for the best master thesis in the Czech Republic.

May 2020 **Qualcomm Innovation Fellowship** Europe Finalist.

Mar 2020 **First place in Werner von Siemens award for the best master thesis** in the Czech Republic. Highly selective, prestigious, and well-known award.

Sep 2019 **Best Paper Honorable Mention** at German Conference on Pattern Recognition 2019 [7]. News.

Jun 2019 Master's degree with distinctions.

Jan 2018 **Valeo scholarship** - two-year scholarship for exceptional master students at CTU sponsored by Valeo (multinational company for automotive driving).

Jan 2018 **Upsilon Pi Epsilon** - lifetime membership in honour society Upsilon Pi Epsilon: International Honor Society for the Computing and Information Disciplines.

Nov 2017 **Josef Hlávka's Award** (Cena Josefa Hlávky) – a highly prestigious award for best students and graduates in the Czech Republic. Awarded by The Foundation of Josef, Marie and Zdeňka Hlávka, the oldest Czech foundation established in 1904. Online: `http://www.hlavkovanadace.cz/cinnost_2017.php`

Aug 2017 **Dean's Award** for an exceptional bachelor thesis. Bachelor's degree with distinctions. Faculty of Electrical Engineering, Czech Technical University in Prague.

2014-2019 Merit scholarships for excellent study results.

Teaching

2019-2020 **Computer Vision**, Teaching Assistant.

2021 **Mixed Reality Lab**, Teaching Assistant.

2020-2023 **3D Vision**, Teaching Assistant.

2020-2023 **Deep Learning Seminar**, Teaching Assistant.

Supervising

Nov 2023 **Master thesis**, Rong Zou: Retrieval Robust to Object Motion Blur, in review [19].

May 2023 **Semester project**, Yiming Zhao: Recovering Blurry Human Body, accepted to ICCV 2023 [15].

Mar 2022 **Semester project**, Thakur Rajat: Predicting 3D Shape and Texture of Fast Moving Cars.

Sep 2021 **Master thesis**, Adrian Klaeger: Temporal Super-Resolution of Multiple Fast-Moving Objects.

Jun 2021 **Semester project**, Harish Rajagopal: Improving DeFMO With Learned Losses.

April 2021 **Bachelor thesis**, Julius Fricke: ADMM Algorithm Unrolling: Deblurring and Matting.

Reviewing

CVPR Conference on Computer Vision and Pattern Recognition: 2022-Present.

ICCV International Conference on Computer Vision: 2023-Present.

ECCV European Conference on Computer Vision: 2022-Present.

NeurIPS Conference on Neural Information Processing Systems: 2023-Present.

ICLR International Conference on Learning Representations: 2024.

3DV International Conference on 3D Vision: 2022-Present.

WACV Winter Conference on Applications of Computer Vision: 2024.

PAMI Transactions on Pattern Analysis and Machine Intelligence: 2022-Present.

Invited talks

12.10.2023 Deep Layers 2023 Workshop – invited talk: https://www.isibrno.cz/deep/assets/dl2023_program.pdf

14.12.2022 UTIA, Czech Academy of Sciences – invited talk: http://zoi.utia.cas.cz/node/1190

21.09.2022 Deep Layers 2022 Workshop – invited talk: https://www.isibrno.cz/en/deep-layers-2022

22.09.2019 Honest Guide in Prague – interview: https://youtu.be/JaJYOmo-fl8?t=218

10.05.2019 Czech Technical University in Prague – invited speaker: https://youtu.be/95ekFuXtUsk

07.07.2018 Eastern European Conference on Computer Vision (EECCV), Odessa, Ukraine – invited speaker: https://youtu.be/mhyhNygOIgU, https://eecvc.com/speaker-4-columns-style-1/

23.07.2017 Conference on Computer Vision and Pattern Recognition (CVPR), Honolulu, Hawaii. Presented demo on fast moving objects.

Languages

Native **Ukrainian**

Fluent **English, Czech**

Intermediate **German**

Publications

[20] **D. Rozumnyi**, N. Rüegg, O. Sbai, F. Arcadu, Y. Chen, A. Sanakoyeu, M. Kumar Marram Reddy, C. Herold, R. Kips. *XR-MBT: Multi-modal Full Body Tracking for XR through Self-Supervision with Learned Depth Point Cloud Registration*. Submitted to ECCV 2024.

[19] R. Zou, M. Pollefeys, **D. Rozumnyi**. *Retrieval Robust to Object Motion Blur*. Submitted to ECCV 2024.

[18] R. Spetlik, **D. Rozumnyi**, J. Matas. *Single-Image Deblurring, Trajectory and Shape Recovery of Fast Moving Objects with Denoising Diffusion Probabilistic Models*. Winter Conference on Applications of Computer Vision (WACV) 2024.

[17] **D. Rozumnyi**, S. Popov, K. Maninis, M. Nießner, V. Ferrari. *Estimating Generic 3D Room Structures from 2D Annotations*. Conference on Neural Information Processing Systems (NeurIPS) 2023.

[16] **D. Rozumnyi**, J. Matas, M. Pollefeys, V. Ferrari, M. Oswald. *Tracking by 3D Model Estimation of Unknown Objects in Videos*. International Conference on Computer Vision (ICCV) 2023.

[15] Y. Zhao, **D. Rozumnyi**, J. Song, O. Hilliges, M. Pollefeys, M. Oswald. *Human from Blur: Human Pose Tracking from Blurry Images*. International Conference on Computer Vision (ICCV) 2023.

[14] D. Barath, **D. Rozumnyi**, I. Eichhardt, L. Hajder, J. Matas. *Progressive-X+: Clustering in the Consensus Space*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2023. Online: https://arxiv.org/abs/2103.13875

[13] **D. Rozumnyi**, M. Oswald, V. Ferrari, M. Pollefeys. *Motion-from-Blur: 3D Shape and Motion Estimation of Motion-blurred Objects in Videos*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2022. Online: https://arxiv.org/abs/2111.14465

[12] **D. Rozumnyi**, J. Kotera, F. Šroubek, J. Matas. *Tracking by Deblatting*. In International Journal of Computer Vision (IJCV), 2021. Online: https://link.springer.com/article/10.1007%2Fs11263-021-01480-w

[11] **D. Rozumnyi**, M. Oswald, V. Ferrari, M. Pollefeys. *Shape from Blur: Recovering Textured 3D Shape and Motion of Fast Moving Objects*. Conference on Neural Information Processing Systems (NeurIPS), 2021. Online: https://arxiv.org/abs/2106.08762

[10] **D. Rozumnyi**, J. Matas, F. Šroubek, M. Pollefeys, M. Oswald. *FMODetect: Robust Detection and Trajectory Estimation of Fast Moving Objects*. International Conference on Computer Vision (ICCV) 2021. Online: `https://arxiv.org/abs/2012.08216`

[9] **D. Rozumnyi**, M. Oswald, V. Ferrari, J. Matas, M. Pollefeys. *DeFMO: Deblurring and Shape Recovery of Fast Moving Objects*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2021, Nashville, United States of America. Online: `https://arxiv.org/abs/2012.00595`

[8] **D. Rozumnyi**, J. Kotera, F. Šroubek, J. Matas. *Sub-frame Appearance and 6D Pose Estimation of Fast Moving Objects*. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020, Seattle, United States of America. Online: `https://arxiv.org/abs/1911.10927`

[7] **D. Rozumnyi**, J. Kotera, F. Šroubek, J. Matas. *Non-Causal Tracking by Deblatting*. In 41th German Conference on Pattern Recognition (GCPR) 2019, Dortmund, Germany. Oral presentation, **Best Paper Honorable Mention**, announced here. Online: `https://link.springer.com/chapter/10.1007/978-3-030-33676-9_9`

[6] J. Kotera, **D. Rozumnyi**, F. Šroubek, J. Matas. *Intra-frame Object Tracking by Deblatting*. In Visual Object Tracking (VOT) Workshop in conjunction with International Conference on Computer Vision (ICCV) 2019, Seoul, South Korea. Online: `http://openaccess.thecvf.com/content_ICCVW_2019/papers/VOT/Kotera_Intra-Frame_Object_Tracking_by_Deblatting_ICCVW_2019_paper.pdf`

[5] **D. Rozumnyi**, I. Cherabier, M. Pollefeys, M. Oswald. *Learned Semantic Multi-Sensor Depth Map Fusion*. In 3D Reconstruction in the Wild (3DRW) Workshop in conjunction with International Conference on Computer Vision (ICCV) 2019, Seoul, South Korea. Online: `http://openaccess.thecvf.com/content_ICCVW_2019/papers/3DRW/Rozumnyi_Learned_Semantic_Multi-Sensor_Depth_Map_Fusion_ICCVW_2019_paper.pdf`

[4] **D. Rozumnyi**. *All-speed Long-term Tracker Exploiting Blur*. Master thesis, Czech Technical University in Prague, 2019. Online: `https://dspace.cvut.cz/handle/10467/82560`

[3] **D. Rozumnyi**. *Tracking, Learning and Detection over a Large Range of Speeds*. Bachelor thesis, Czech Technical University in Prague, 2017. Online: `https://dspace.cvut.cz/handle/10467/70179`

[2] **D. Rozumnyi**, J. Kotera, F. Šroubek, L. Novotný, J. Matas. *The World of Fast Moving Objects*. In IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2017, Honolulu, Hawaii, United States of America. Online: `https://ieeexplore.ieee.org/document/8099997`

[1] J. Pritts, **D. Rozumnyi**, M. P. Kumar, O. Chum. *Coplanar Repeats by Energy Minimization*. In the 27th British Machine Vision Conference (BMVC) 2016, York, England, United Kingdom. Online: `http://www.bmva.org/bmvc/2016/papers/paper107/index.html`