Mikhail Okunev

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Summary

Background: I am a fourth-year PhD candidate in Visual Computing Group in Brown University. Before I had a career as a Machine Learning\Research engineer. I enjoy working with ill-posed 3d reconstruction problems.
Research interests: 3D Reconstruction, Dynamic Novel View Synthesis, Reconstruction from Monocular Videos.
Research experience: Dynamic NeRFs, Dynamic Gaussian Splatting, Time-of-Flight Imaging.

Education

Brown University Sep 2021 – Jun 2026 (est.)
Graduate Student, Visual Computing Group. Advisor: James Tompkin *Providence, RI, USA*

Perm State University Sep 2008 – Jul 2010
Master of Applied Mathematics and Computer Science *Perm, Russia*

Perm State University Sep 2004 – Jul 2008
Bachelor of Applied Mathematics and Computer Science, with honors *Perm, Russia*

Publications and Patents

Publications

- Runfeng Li, **Mikhail Okunev**, Zixuan Guo, Anh Duong, Christian Richardt, Matthew O'Toole, and James Tompkin. Time of the flight of the gaussians: Fast and accurate dynamic time-of-flight radiance fields, 2024, *In Submission*
- Yiqing Liang, **Mikhail Okunev**, Mikaela Angelina Uy, Leonidas J. Guibas, James Tomkin, and Adam Harley. Monocular dynamic gaussian splatting is fast and brittle but smooth motion helps, 2024, *In submission*
- **Mikhail Okunev***, Marc Mapeke*, Benjamin Attal Christian Richardt, Matthew O'Toole, and James Tompkin. Flowed time of flight radiance fields. In *Proceedings of the European Conference on Computer Vision (ECCV)*, 2024
- Zhengqin Li, Li Yu, **Mikhail Okunev**, Manmohan Chandraker, and Zhao Dong. Spatiotemporally consistent hdr indoor lighting estimation. *ACM Trans. Graph.*, 42(3), jun 2023
- Anton Kaplanyan, Anton Sochenov, Thomas Leimkuehler, **Mikhail Okunev**, Todd Goodall, and Gizem Rufo. DeepFovea: Neural reconstruction for foveated rendering and video compression using learned statistics of natural videos. *ACM Trans. Graph. (Proc. SIGGRAPH Asia)*, 38(4):212:1–212:13, 2019

Patents

- **Mikhail Okunev** and Anton Kaplanyan. Enhancing the resolution of a video stream, April 29 2021. US Patent App. 16/662,725
- Anton Kaplanyan, Jiahao Lin, and **Mikhail Okunev**. Neural reconstruction of sequential frames, April 29 2021. US Patent App. 16/662,725
- Samuel Bruce Weiss, Anna-Katrina Shedletsky, Simon Kozlov, Ana Ulin, **Mikhail Okunev**, and Isaac Sukin. Method for predicting defects in assembly units, April 18 2019. US Patent App. 15/953,216
- Allison Elaine Ball, Kaushik Mohan Iyer, Ashoat Tevosyan, and **Mikhail Okunev**. Ranking and filtering comments based on feed interaction history, November 19 2019. US Patent 10,482,090
- Allison Elaine Ball, Kaushik Mohan Iyer, Ashoat Tevosyan, **Mikhail Okunev**, and Erich James Owens. Ranking and filtering comments based on author and content, February 26 2019. US Patent 10,216,803
- Allison Elaine Ball, Kaushik Mohan Iyer, Ashoat Tevosyan, **Mikhail Okunev**, and Erich James Owens. Ranking and filtering comments based on impression calculations, August 21 2018. US Patent 10,057,199
- Allison Elaine Ball, Kaushik Mohan Iyer, Ashoat Tevosyan, **Mikhail Okunev**, Ian Warren Vonseggern, and Harsha Bhangdia. Ranking and filtering comments based on labelling, May 18 2017. US Patent App. 14/942,964
- Allison Elaine Ball, Kaushik Mohan Iyer, Ashoat Tevosyan, **Mikhail Okunev**, and Erich James Owens. Ranking and filtering comments based on audience, January 28 2020. US Patent 10,545,969
- Allison Elaine Ball, Kaushik Mohan Iyer, Ashoat Tevosyan, **Mikhail Okunev**, and Erich James Owens. Ranking and filtering comments based on audience, January 28 2020. US Patent 10,545,969

Industrial and Research Experience

Research Intern Jun 2022 – Jun 2023

Adobe Research *Remote*

- I worked with Zexiang Xu and Oliver Wang as my primary mentors, researching a compact and fast representation for dynamic NeRFs.

Research Engineer Sep 2018 – Jun 2021

Graphics Research, Facebook Reality Labs *Redmond, USA*

- I worked on ML-based foveated rendering system DeepFovea. The underlying network performs a video reconstruction from sparse frames (1–10% valid pixels). Contributed to the network's temporal stability and efficiency. 5× efficiency improvement through architectural changes. (Jiahao Lin's intern project)
- Co-authored a SIGGRAPH Asia 2019 paper about DeepFovea. Wrote ML part of the paper and prepared necessary ablation studies.
- Together with a product team, led ML efforts on an internal superresolution-based rendering pipeline.
- Contributed to a lightning modeling project. Later published in ACM ToG.
- Participated in preparing internal semi-annual demos and posters.
- Co-supervised two PhD interns.

Freelance ML developer Jul 2017 – Aug 2018

Personal leave *Perm, Russia*

- Spent a year in Russia resolving family-related issues.
- Did several contracts\consulting jobs in applied computer vision.
- Designed a 4-month long introductory computer vision course. Organized first ML meetup in Perm. See *Teaching experience* for more details.

Senior ML Engineer Jan 2017 – Jul 2017

Instrumental *Palo Alto, USA*

- Worked on an automatic defects detection system for manufacturing pipelines. The company was a seed-round startup by the time I joined.
- Introduced classical techniques (one-class SVM, clustering) to an existing anomaly detection system. Significantly improved accuracy and robustness over the baseline.
- The company attracted clients (sample case study) and received a round A of investment.

Senior ML Engineer Jan 2014 – Aug 2016

Facebook *Seattle, USA*

- Led efforts on building the first ML-based ranking system for Facebook comments and significantly improved comments quality over two years. Contributed to all parts of the ML pipeline: logging, labeling guidelines, models, features, A\B testing, metrics, infrastructure.
- Was responsible for comments safety on Facebook. Built multiple spam classifiers. Significantly reduced the amount of comment spam over time.
- Supervised intern's project on spam detection using clustering.
- Was working on a new fraud detection system for Ads. Worked on a methodology, features, rules, ML classifiers.

ML Engineer (SDE II) Nov 2011 – Dec 2013

Microsoft Bing *Bellevue, USA*

- Built similarity detection models for deduplication of semi-structured texts. The system was developed for Bing.Shopping to find and conflate identical items from various online stores.
- Built a menu items suggestion system for restaurants, based on a sentiment analysis of user reviews. Deployed in Bing.Local.

Software Engineer Jan 2011 – Nov 2011

AlternativaGames *Perm, Russia*

- AlternativaGames is a video game company, which develops a popular game Tanki Online.
- I led a small team building a custom full-featured 3D physics engine for Flash. The technology was showcased at E3 2011.
- Developed a set of custom concurrent hashmaps for the game server.

Software Engineer Intern Mar 2010 – Jun 2010

Google *Zurich, Switzerland*

- As a part of AdSpam team, I was working on internal tools for log analysis.

Software Engineer Intern Jun 2009 – Sep 2009

Microsoft *Redmond, USA*

- I was working on porting Access Online rendering to Silverlight. Received an offer for a full-time position.

Selected Awards and Achievements

National and international programming competitions

- Qualified for Google Code Jam local onsite in London, 2008. Prior to that went through four elimination rounds and finished 298th out of more than 10000 first round participants.
- Top-10% in All-Russian Northern Eastern European Regional Contest, 2008. ACM ICPC Semifinal. 19th\202 place.
- 1st degree diploma of all-Russian open programming contest in Kazan, 2008.
- 1st degree diploma of all-Russian programming contest in Yoshkar-Ola, 2005.

Regional programming competitions

- 1st degree diploma of Ural ACM ICPC Quarterfinal, 2006. 2nd\46 place.
- 2nd degree diploma of Ural Championship, 2008. 7nd\55 place.
- 1st place in Perm region programming competition, 2008.

Stipends, other awards

- Dean's list, 2010.
- Scholarship for excellent academic achievements, by Utel company, 2009.
- Scholarship for gifted students, by Ministry of Education, 2006.

Teaching Experience

Programming competitions coach 2006 – 2011

- Taught theory of algorithms to schoolchildren and students at Kungur High School and Perm State University respectively.
- My student Anton C. took an absolute second place, among his age group, at All-Russian Olympiad in Informatics 2009, and became a candidate for International Olympiad in Informatics.
- In 2009-2011 I was coaching a PermSU team. In 2013 the team took Bronze Medal in ACM ICPC World Finals.

Teaching Assistant at Perm State University 2008 – 2011

- Was conducting classes in Algorithms, Cryptography, Cryptographic Protocols, Information Theory

Educational projects 2017 – 2018

- Supported by a local company Macroscop, I designed and conducted an introductory 4-month long **computer vision course** for a class of 20 local students. Several of them started their careers in ML afterwards.
- Together with another local company, Xsolla, I organized the first **ML meetup** in Perm. For a year, meetup members were giving talks on recent ML papers, covering multiple topics (computer vision, natural language processing, reinforcement learning). We also conducted several hackathons to allow participants to apply their knowledge. On average, there were 50 people attending the sessions.

Technical Skills

Relevant Languages and Frameworks: Python, C/C++, CUDA, Tensorflow, Keras, Pytorch

Other

Personal Info

- US citizen