ALEKSEI ZHURAVLEV

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EDUCATION

MSc in Computer Science — **University of Bonn, Germany**, **Oct 2022 – Sep 2024**

BSc in Physics — **Moscow State University, Russia**, **Sep 2018 – Aug 2022**

RESEARCH EXPERIENCE

Research Assistant — **ETH Zürich, remote**

Supervisors: Prof. Danda Pani Paudel, Dr. Thomas Probst — **Apr 2023 – Present**

- Developed a NeRF-based 3D reconstruction of the human hand from 60 images; evaluated on 500+ sequences from the Interhand3.6m dataset
- Implemented a point-mesh distance finding algorithm on the GPU; reduced the calculation time from 5s to 0.3s compared to the CPU baseline
- Introduced perceptual loss (LPIPS) to enhance the visual quality; improved PSNR score by 14% over MSE loss

Research assistant — **Moscow State University, Russia**

Supervisors: Prof. Sergei Popov, Prof. Roberto Turolla — **Nov 2019 – Feb 2022**

- Developed a dark matter detection model using satellite images of neutron stars; processed 3.1 TB of data collected over 4 years
- Utilized Very Deep Super-Resolution (VDSR) network to upscale low-resolution satellite images; improved SSIM metric by 11% over the baseline bicubic interpolation
- Implemented a background subtraction model based on the R-CNN network; achieved a 3x speedup compared to the GrabCut algorithm

PUBLICATIONS

- **Toward Constraining Axions with Polarimetric Observations of the Isolated Neutron Star RX J1856.5–3754** (PDF)
  A. Zhuravlev, R. Taverna, R. Turolla; *The Astrophysical Journal* (2022)
- **Photon-axion mixing in thermal emission of isolated neutron stars** (PDF)
  A. Zhuravlev, S. Popov, M. Pshirkov; *Physics Letters B* (2021)

PROJECTS

- **Lab in Computer Vision** — **Apr 2023 – Sep 2023**
  Report, Code

  Developed a human pose prediction model composed of convolutional layers and Squeeze-and-Excitation blocks; reduced the Mean Per Joint Position Error (MPJPE) by 2.9% over the baseline transformer model

- **Seminar in Computer Vision** **Sep 2023**
  Report, Slides
  Presented a paper on 3D panoptic segmentation with TensoRF backend; compared with 4 subsequent works

- **HackaTUM Hackathon** **Nov 2022**
  1st place (Project Page)
  Collected a dataset of 57 3D scans with a microwave detector; trained a ResNet-based model to recognize 3 types of recyclable waste with 73% accuracy

- **TUM ML4Earth Hackathon** **Oct 2022**
  1st place (Project Page, Overview Notebook)
  Trained a 5-layer MLP-based network to predict soybean yields in 190 US counties over 5 years; reached 11% test set error

ADDITIONAL EXPERIENCE AND AWARDS

- **Teaching assistant, University of Bonn** **Apr 2023 – Sep 2023**
  Co-developed programming assignments for the "Computer Vision" course, attended by 30+ MSc students

- **Teaching assistant, Moscow State University** **Feb 2021 – Jan 2022**
  Instructed groups of 20 undergraduates in the "Programming and Computer Science" course; average grades 4.7 out of 5.0

- **Scholarship for outstanding students, Moscow State University** **Sep 2020 – May 2022**
  Awarded to top 5% of all students

- **Moscow Informatics Olympiad** **May 2020**
  3rd place out of 70+ teams