Aman Urumbekov

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Summary

Dedicated researcher specializing in neural network architectures and Low-level Vision tasks, with a primary focus on Super Resolution. Proficient in developing and optimizing hybrid models by combining state space models and transformers, I aim to push the boundaries of image processing and resolution enhancement. With hands-on experience in cutting-edge algorithms and deep learning techniques, I am passionate about advancing the field of computer vision through innovative research and practical application.

Publications

Contrast: Uniting Transformers and State Space Models for Low-level Vision
KSTU

- Researching the properties and features of a hybrid architecture combining Mamba (State Space Model) and Transformer for Super Resolution. The paper will be completed by mid-November and submitted to CVPR'25.
- **Aman Urumbekov**, Zheng Chen

NTIRE 2024 Challenge on Image SR (×4): Methods and Results(CVPR workshop)
KSTU

- Developed a novel hybrid neural network by integrating Mamba (State Space Models) and Transformers, securing 13th place out of 20 teams despite limited computational resources hindering full model convergence.
- Authors: Zheng Chen, Zongwei Wu, ..., **Aman Urumbekov**, ...

Experience

Computer Vision R&D(Part-Time) February 2024 – Present(9 mos.)
Ik2 Sàrl *Switzerland, Morges*

- Developed a Transformer-based super-resolution algorithm achieving ×2, ×4, ×8, and ×16 scaling, enhancing 10m satellite images to 62.5cm resolution. earthtodate.com (Note: the website may take a moment to load)
- Configured training processes on a parallelized system with 8 high-end GPUs.
- Devised powerful heuristics tailored to the specific nuances of super-resolution tasks.
- Created versatile Transformer-based architectures achieving ×4 and ×10 super-resolution, adaptable across different satellite sources and generalizable to new ones.

Data Scientist(Part-Time) November 2022 – June 2023(7 mos.)
TheCramerProject *Kyrgyzstan, Bishkek*

- Developed a new OCR algorithm capable of reading Kyrgyz language text with 99.32% accuracy.
- Trained a total of 40 individuals, including bankers and fintech employees, in the fundamentals of Computer Vision.

Honors and Awards

2x International Science-Technical Conference for Young Scientists **March 2023, March 2024**

- Awarded top recognition in the top 6.9% of submissions nationwide for two consecutive years.

First Place at Datathon Summer 2023 - Northeastern University **July 2023**

- Won 1 place among 27 participants with a MSLE of 0.11330 on the private metric.

First Place in Datathon for Kyrgyz Handwritten Letter Recognition **November 2022**

- Won 1 place among 100+ participants with an accuracy of 99.09% on the private metric.

Fourth Place at OEMC Hackathon: EU Land Cover Classification **September 2023**

- Won 4 place among 31 contenders, marked by a 0.49583 weighted F1-score.

Third Place at FinOlimp **September 2023**

- Ranked in the top 3 among nearly 2,000 participants, demonstrating exceptional expertise in enhancing mobile banking security and functionality through automated personal document scanning with OCR.

Education

Kyrgyz State Technical University (GPA 3.94/4.0) Kyrgyzstan, Bishkek
Bachelor of Data Science and Machine Learning *Aug. 2022 – May 2026(Expected)*

Technical Skills

Languages: Python, C/C++
Frameworks: PyTorch, TensorFlow and Keras, Scikit-learn
Developer Tools: Git, Jupyter Lab
Libraries: Pandas, NumPy, Matplotlib, Seaborn, Plotly