Andrei Popov

ML Engineer

traptrip | traptrip | aspopov | aletni@gmail.com

Summary

Experienced computer vision engineer with a strong background in developing and deploying machine learning systems for various applications. Have a proven track record of successfully executing projects in object detection, classification, and tracking. Proficient in Python, I have experience in using deep learning frameworks such as TensorFlow and PyTorch. Have a passion for utilizing my expertise in computer vision and machine learning to tackle complex problems and drive innovation. Seeking to apply my skills and experience to a challenging research role.

Work Experience

Napoleon IT - *ML Engineer* Aug 2019 - present

- Successfully enhanced the speed and quality of the retail store's product and price recognition system, resulting in a 20% improvement in accuracy. *(PyTorch, TensorFlow, OpenVino, Flask, XGBoost, Hydra, Docker, Metric Learning)*
- Development and deployment of a computer vision module for detecting irregularities in production *(PyTorch, Nvidia Triton Server, TensorRT, YoloV5, DeepSort, EfficientNet, Docker)*
- Development and deployment of a system for monitoring and controlling access to the office by face with an additional module of temperature analysis *(PyTorch, RetinaFace, Docker)*
- Development of a system that counts unique visitors to the store through the use of a video camera *(PyTorch, OpenCV, Docker)*

AI Talent Hub - *Mentor* Sep 2022 - Feb 2023

- Providing expert guidance to students on deep learning and computer vision-related matters
- Conducting thorough evaluations of students' final project submissions

Projects

Educational Video Analytics Source code

The system designed for use in educational institutions. It can recognise students' emotions in real-time through video. The following technologies were used in developing the system: face detector (RetinaFace), face tracker (DeepSort), emotion classifier (Deep Alignment Network).

Landmark Retrieval Source code

A service for searching for similar landmarks based on a query image was developed. The training utilized a metric-learning approach. The final search is performed using FAISS.

Music Track Artist Search Source code

A collection of anonymized acoustic features from music recordings has been provided. The objective is to identify the most suitable authors. In addition to classification, the model can also be used to evaluate the similarity between different artists and to distinguish different artists but with similar names.

Speaker Recognition Bot Source code

A Telegram bot to remember and people by their voice. Speaker recognition is achieved by extracting unique voice features, storing them in a database, and using the K-Nearest Neighbors classifier to assess vector similarity during the inference stage.

Aerial Photos Matching using Deep Learning Source code

A model was developed that takes an image as input and determines its position and rotation angle on the substrate. The challenge lies in the possibility of the substrate and image being captured at different times of the year or with overlapping clouds.

Voice Commands Recognition Source code

Various models were compared for classifying different voice commands, and the ensemble of ResNet18 and EfficientNetB0 showed the best performance. Mel-spectrograms were used as input features.

Education

2022 - present	Master's in **Deep Learning and Generative AI** from **ITMO**	(GPA: 4.8/5.0)
2021 - 2022	**Data Science** specialization from Big Data Academy	Certificate
2018 - 2022	Bachelor's in Computer Science from **South Ural State University**	(GPA: 4.97/5.0)

Publications

Popov, Andrey S. and Sergey A. Ivanov (2021). "Neural Network Models for Russian Language Speaker Recognition". In: *2021 International Conference on Quality Management, Transport and Information Security, Information Technologies (IT&QM&IS)*, pp. 533–536. DOI: 10.1109/ITQMIS53292.2021.9642756.

Skills

Programming language & platforms	Python, Linux, MacOS
Scientific computing libraries	NumPy, Pandas, Matplotlib, Plotly
Computer vision libraries	OpenCV, TorchVision, Timm
Deep learning frameworks	PyTorch, TensorFlow, Transformers
Development & deployment	Flask, FastAPI, Docker, Nvidia Triton Server
Version control	Git, GitLab, DVC, MLflow, ClearML
Soft skills	Ability to work independently and in a team setting, strong communication skills, the ability to present technical information to non-technical audiences

Awards

Leaders of Digital Transformation (task 5) - "Products Matching"	2d place
SIBUR Challenge - "Video Analytics"	3rd place
Digital Breakthrough 2022 - "AI to identify students' emotions"	1st place
Digital Breakthrough 2022 - "Aerial Photos Matching"	2d place
AI Journey Contest 2022 - "Multilingual translation from national languages"	2d place
Kaggle	Notebooks Expert