Davit Soselia

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SKILLS

Programming and Scripting Languages: (Proficient) Python, C++, SQL (Familiar) JS, Swift, Java, C#.
Python Frameworks: PyTorch, TensorFlow, Scikit-learn, OpenCV, FastAPI, HuggingFace libraries.
Platforms&Tools: Hadoop, Spark, Git, Slurm, AWS, Azure, Docker, Kubernetes, Azure, CoreML, Xcode.

CURRENT PROJECTS

Prompted-adjusted code generation from images (arXiv)
Under Professor Tianyi Zhou.

- Working on improving HTML/CSS/JS code generation from visual input such as designs, screenshots, and sketches, by using DiT and GPT2 as a base and improving the process using visual critic-based feedback loop. With the dataset developed for the project by scraping and extracting relevant code from over 10,000 open-source projects. The model will aid front-end development by automating some of the simple tasks, allowing developers to tackle more complex challenges.

Shift-Equivariant Vision Transformers (arXiv)
Under Professor Furong Huang.

- Investigating shift-equivariance in vision transformers and its impact on image recognition and classification tasks.
- Currently testing the proposed shift-equivariant vision transformer architecture using Pytorch on ViT, Swin, and Twins model architectures, demonstrating its potential for improved image recognition and classification performance.
- The shift-equivariance offers benefits such as enhanced robustness to input variations, improved image recognition accuracy, and reduced susceptibility to small input shifts, ultimately leading to better generalization and performance in real-world applications.

EDUCATION

Master of Science: Computer Science
University of Maryland | College Park, Maryland | May 2024 (Expected)

- 3.67 GPA

Bachelor of Science: Computer Engineering
San Diego State University | San Diego, California | 2019

- 4.00 GPA

EXPERIENCE

Research Engineer

KTH Royal Institute of Technology | Stockholm, Sweden | August 2020 - Jun 2022 (Intermittent)

- Developed a Python library for Lower-limb Joint Torque Prediction from EMG time-series data in TensorFlow.
- Accelerated a robotic arm's object orientation detection module by 230% through the implementation of TensorRT and optimization of the OpenCV pipeline in C++.

Co-founder, Machine Learning Engineer

Arkus AI | Stockholm, Sweden | Jun 2020 - May 2022

- Developed an image processing pipeline for faster chromosome analysis, which decreased the time spent on karyotyping by 30%. Utilized OpenCV for initial segmentation and U-net for precise segmentation, greatly enhancing the efficiency of the process.
- Built pipelines for data versioning, model training and deployment in AWS.
- Developed an interactive React web application and trained models to assist genetic counselors in constructing pedigree trees, evaluating associated risks, and generating comprehensive reports for users.

Software Engineer

Airo | Tbilisi, Georgia | Aug 2018 - April 2020

- Developed visual classification pipeline and implemented corresponding UI in iOS and android apps, automate part of the insurance signup process, saving hundreds of hours of manual review.
- Redesigned customer data processing pipeline by extracting information from PDF using Tesseract and moved the pipeline to AWS, oriented around Amazon Redshift, thus increasing data availability and accessibility for data science and machine learning tasks.

PAPERS

D. Soselia, K. Saifullah, T. Zhou (2023), Vision-Code Transformer for Screenshot-to-HTML/CSS Generation, T4V@CVPR2023.

L. Zhang, **D.Soselia**, R. Wang, E. Farewik (Sep, 2023), Estimation of Joint Torque by EMG-driven Neuromusculoskeletal Models and LSTM Networks, IEEE Transactions on Neural Systems and Rehabilitation Engineering.

L. Zhang, **D.Soselia** , R. Wang (Mar, 2022), Lower-limb Joint Torque Prediction using LSTM Neural Networks and Transfer Learning, IEEE Transactions on Neural Systems and Rehabilitation Engineering.

C. Paolini, **D.Soselia**, H. Baweja, M.Sarkar (Dec, 2019), Optimal Location for Fall Detection Edge Inferencing, IEEE Globecom2019.

D. Soselia, L. Shugliashvili, I. Koberidze, S.Amashukeli, S. Jijavadze, G. Chelidze (Dec, 2018), Freezing Networks: Weight Preservation Procedure for Continual Learning, NeurIPS 18 Workshop on Continual Learning.

D. Soselia, M. Tsintsadze, L. Shugliashvili, I. Koberidze, S.Amashukeli, S. Jijavadze (Nov, 2018), On Georgian Handwritten Character Recognition, IFAC-PapersOnLine 51.30 (2018): 161-165.