Serdar Yıldız

serdaryildiz.com Scholar Github Linkedin e-mail

I am a highly motivated computer engineering researcher specializing in computer vision, machine learning, and deep learning, with extensive experience in leading research projects, developing state-of-the-art models, and publishing in high-impact journals. My work focuses on applying innovative solutions to complex challenges, particularly in biometrics, object detection, scene text recognition, and medical image analysis. I am skilled in both independent research and collaborative team efforts, and I am committed to advancing the field of artificial intelligence through meaningful and impactful contributions.

Education

Yıldız Technical University, Turkey 2021 – 2024
Master of Science in Computer Engineering *GPA: 3.93 / 4.0*

Yıldız Technical University, Turkey 2016 – 2021
Bachelor of Science in Computer Engineering (High Honour) *GPA: 3.54 / 4.0*

Czech Technical University in Prague, Czech Republic Spring 2020
Erasmus+ Exchange Program *Incomplete due to COVID-19*

Experience

The Scientific and Technological Research Council of Turkey | *Researcher* Jun. 2021 – Present
Conducting advanced research in computer vision, leading a team with a focus on biometrics, object detection, image captioning, OCR, and so on. Developed and optimized deep learning models to ensure high generalization performance and efficiency, contributing to both academic publications and practical implementations.

ID3 Software | *Intern* Aug. 2020 – Mar. 2021
Contributed to the development of an airport ground services monitoring project, utilizing computer vision techniques for automation and efficiency improvement. This work also served as the basis for the Bachelor's thesis, involving object detection and object tracking methodologies.

Vakıf Emeklilik ve Hayat | *Intern* Jun. 2019 – Aug. 2019
Analyzed customer churn in the private pension system using machine learning techniques. Developed predictive models to identify customer churn patterns, contributing to retention strategy planning.

Publications

Person Re-Identification

Focusing on developing models with superior generalization capabilities to improve person re-identification performance across diverse real-world applications.

- **ArcTransID: Towards Real-World Adaptability in Person Re-Identification through Advanced Sampling and Loss Strategies**, *Conference on Computer Vision and Pattern Recognition*, 202*. *(Under Review)*
- **What is Wrong with Image Person Re-Identification?**, *The 19th IEEE International Conference on Automatic Face and Gesture Recognition*, 202*. *(Under Review)*

1. **ENTIRe-ID: An Extensive and Diverse Dataset for Person Re-Identification**, *18th IEEE International Conference on Automatic Face and Gesture Recognition*, 2024.

Scene Text Recognition

Developing extensive real and synthetic datasets and a novel recognition model to improve the performance of scene text recognition, particularly for Turkish language datasets.

1. **Turkish Scene Text Recognition: Introducing Extensive Real and Synthetic Datasets and a Novel Recognition Model**, *Engineering Science and Technology, an International Journal*, 2024.

Image Captioning

Addressing the gap in Turkish image captioning by developing advanced models and datasets to improve computer understanding and description of images in Turkish. Focused on the relationship between images and language towards achieving artificial general intelligence.

- **TRCaptionNet++: A High-Performance Encoder-Decoder Based Deep Turkish Image Captioning Model Fine-Tuned with a Large-Scale Set of Pretrain Data**, *Turkish Journal of Electrical Engineering and Computer Sciences*, 202*. *(Under Review)*

1. **Turkish Image Captioning with Vision Transformer Based Encoders and Text Decoders**, *32nd Signal Processing and Communications Applications Conference*, 2024.
2. **TRCaptionNet: A Novel and Accurate Deep Turkish Image Captioning Model with Vision Transformer Based Image Encoders and Deep Linguistic Text Decoders**, *Turkish Journal of Electrical Engineering and Computer Sciences*, 2023.
3. **Automatic Turkish Image Captioning: The Impact of Deep Machine Translation**, *8th International Conference on Computer Science and Engineering*, 2023.

Geo-Localization

Focusing on a methodology that can effectively address geo-localization gaps in various environmental conditions, particularly for dense coverage.

- **YILDIZ Visual Geo-localization: A Novel Dataset with Dense Coverage Under Diverse Environmental Conditions for Visual Place Recognition**, *Image and Vision Computing*, 202*. *(Under Review)*

Nuclei Instance Segmentation (MSc Thesis)

Developing methods for nuclei instance segmentation in medical images, addressing the challenges in histology image segmentation, especially with imbalanced datasets.

- **An Ensemble Learning Based Nuclei Segmentation: Using Base Deep Learning Models with Different Loss Functions**, *8th International Symposium on Innovative Approaches in Smart Technologies*, 2024. *(Accepted)*

1. **A Comparative Analysis of Loss Functions in Segmentation of Medical Images with Highly Imbalanced Class Distribution**, *International Conference on Innovations in Intelligent Systems and Applications*, 2024.
2. **Semantic and Instance Segmentation of Multi-organ Cell Nuclei Using Deep Learning Based Methods**, *32nd Signal Processing and Communications Applications Conference*, 2024.
3. **Segmentation of Cell Nuclei in Histology Images with Vision Transformer Based U-Net Models**, *32nd Signal Processing and Communications Applications Conference*, 2024.
4. **Nuclei Instance Segmentation in Colon Histology Images with YOLOv7**, *International Conference on Advanced Engineering, Technology and Applications*, 2023.
5. **Size-based Adaptive Instance Pruning for Refined Segmentation of Cell Nuclei in Histology Images**, *31st Signal Processing and Communications Applications Conference*, 2023.
6. **Nuclei Segmentation in Colon Histology Images by Using the Deep CNNs: A U-Net Based Multi-class Segmentation Analysis**, *Medical Technologies National Conference*, 2022.

Mitotic Cell Detection (TUSEB Project)

Working as a scholar researcher on a TUSEB-managed melanoma cancer decision support system project, focusing on object detection and mitosis identification in digital pathology.

1. **CNMI-YOLO: Domain Adaptive and Robust Mitosis Identification in Digital Pathology**, *Laboratory Investigation*, 2024.
2. **Performance Analysis of the YOLO Series for Object Detection: Detection of Mitosis Cells in Histopathology Images**, *Medical Technologies National Conference*, 2023.

Semi-Supervised Learning

Exploring semi-supervised learning techniques to enhance the generalization performance of models across diverse datasets and scenarios.

1. **Iterative Ensemble Pseudo-Labeling for Convolutional Neural Networks**, *Sigma Journal of Engineering and Natural Sciences*, 2024.

Turnaround Control System (B.S. Thesis)

Developed a turnaround control system to automatically detect and monitor the time stamps of ground service actions in airports, utilizing object detection and tracking techniques.

1. **A Turnaround Control System to Automatically Detect and Monitor the Time Stamps of Ground Service Actions in Airports: A Deep Learning and Computer Vision Based Approach**, *Engineering Applications of Artificial Intelligence*, 2022.

Customer Churn Analysis (B.S. Project)

Analyzed customer churn in the Turkish private pension system using machine learning techniques during an internship at Vakıf Emeklilik ve Hayat.

1. **Customer Churn Analysis**, *28th Signal Processing and Communications Applications Conference*, 2020.