

Mohamed Hedi Elfkir

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EDUCATION

Sep 2019 - June 2020 Turkish language course at **Hacettepe University** C1
Sept 2020 - June 2024 Bachelor Computer Engineering at **Hacettepe university** (GPA: 3.55/4.0)

Selected Course Work: Algorithms, Computer Vision, Machine learning, Artificial Intelligence, Probability, Statistics.

RESEARCH EXPERIENCE

Research Fellow @HUCVL lab supervised by Professors Erkut Erdem & Aykut Erdem March 2022 - present
Hacettepe University *Ankara, Turkey*

ST360IQ: No-Reference Omnidirectional Image Quality Assessment with Spherical Vision Transformer

- Achieved 0.98 PLCC and 0.97 SRCC on CVIQ benchmarks, and 0.96 PLCC and 0.95 SRCC on OIQA benchmarks, surpassing state-of-the-art models.
- Integrated the ATSal saliency model, increasing baseline results by 2% for PLCC and 3% for SRCC, and reducing processing time by 20%.
- Conducted extensive comparative experiments with 18 other metrics.

LGT360IQ: Local-Global Transformer for 360° Image Quality Assessment

- Integrated adaptive token selection for top-down attention, reducing computational overhead and trainable parameters by 17 million.
- Realized a 2% increase in both PLCC and SRCC, enhancing overall performance.
- Extended empirical evaluations to include 3 benchmarks and 2 additional metrics.
- Drafted the initial manuscript, contributing to a comprehensive 30-page submission.

Research Fellow @KUISAI lab supervised by Professors Aykut Erdem & Erkut Erdem July 2022 - Sept 2022
Koc University *Istanbul, Turkey*

Project: ViT-Enhanced Pix2Pix: Empowering Image Synthesis with Vision Transformer-Based Loss

- Implemented ViT-matching-loss based on **DINO** replacing **LPIPS** to have more disentangled representations leading to 20% faster convergence and better qualitative results.

WORK EXPERIENCE

AI Engineer Apr 2022 - present
Titra Teknoloji, Radio Assist *Ankara, Turkey*

- Adapted the ResUnet++ architecture to handle 3D MR data.
- Attained 85% sensitivity and reduced the false positive rate to 0.4 per patient.
- Co-authored the paper "BainMR AI: Enhanced Aneurysm Detection through Intensity Prior and Voxel-Wise Labeling on TOF-MRA" (submitted for journal review).

AI Engineer Intern Sept 2021 - Dec 2021
Launchpad AI *San Francisco, USA*

Project: Deep Learning for Spine Implant Classification: Enhancing Accuracy in Medical Diagnosis

- Developed an AI tool to classify spine implants resulting in a 43% efficiency boost by integrating the DETR model for implant cropping.
- Monitored and validated test results, and ensured the validity of the training data.
- Generated weekly reports about the new recommendations and future work to the stakeholders.

COMPETITIONS

Fire Mapping using Satellite imagery (EY Data Science Challenge): [Link to Repo](#)

- Managed imbalanced GeoDataFrame datasets, aerial line scans, and satellite imagery from Sentinel-1 and Sentinel-2 using Open DataCube.
- Accomplished a significant 74% Segmentation Score in fire region mapping, leading to a top-20 world ranking in the finals (May 2021).

PUBLICATIONS

- **ST360IQ: No-Reference Omnidirectional Image Quality Assessment with Spherical Vision Transformers** (Accepted)
Authors: Nafiseh Jabbari Tofighi, **Mohamed Hedi Elfkir**, Nevrez Imamoglu, Cagri Ozcinar, Erkut Erdem, Aykut Erdem
Venue: ICASSP2023
- **Omnidirectional Image Quality Assessment with Local-Global Vision Transformers** (Accepted)
Author: Nafiseh Jabbari Tofighi*, **Mohamed Hedi Elfkir***, Nevrez Imamoglu, Cagri Ozcinar, Erkut Erdem, Aykut Erdem
Venue: Image and Vision Computing

TEACHING

- **ACM instructor** Introduction to machine learning [Lecture](#)
Delivered an Engaging Overview of Supervised Machine Learning for 15+ students.
- **Student teaching Assistant** Algorithm class [Link](#)
Developed and Curated a Diverse Set of Algorithm Practice Problems for Effective Learning and Assessment Across a Large Cohort of 100+ Students

AWARDS & ACHIEVEMENTS

- **Bachelor Scholarship:** Chosen from a pool of 150,000 students to receive a full four-year scholarship for a Bachelor's degree in Computer Engineering at Hacettepe.
- **Outstanding Achievement Scholarship Program:** Acknowledged as one of the top Turkish scholarship recipients.
- **Microsoft Beta Student Ambassador:** Chosen ambassadors from around the world are given a platform to connect with professionals and like-minded students, fostering collaboration, learning, and growth.
- **EY Better Working World Data Challenge Semi-Finalist:** Distinguished achievement, securing the 20th position among over 8,500 talented participants, in a competition dedicated to advancing a more sustainable and improved global work environment.

SKILLS

Languages: Arabic (Native), French(Native) , English(C2), Turkish(C1)

Programming Languages: Python, C++, Java

Tools : git, VScode, Azure.

Libraries : Pytorch, Tensorflow, OpenCV, Skimage, SimpleITK, Pydicom.