Oleksandr Kovalyk Borodyak

TELEMATICS ENGINEER

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Title	Institute	Year
Master's Degree in Telematics Engineering	Technical University of Cartagena	2021
Bachelor Degree in Telematics Engineering	Technical University of Cartagena	2020

Summary

I am passionate about technology and innovation. I see myself as a responsible individual, capable of adapting and learning swiftly. I enjoy working in a team and contributing new ideas. I consider myself to be a person with initiative, always eager to learn and improve day by day. I love tinkering with technology and learning new things beyond my field of study. I am a person who is always looking for new challenges and opportunities to grow professionally. In my free time, I usually do sport, my favorite sport is weightlifting.

Professional Experience

Research Assistant | Technical University of Cartagena & EU Life Project

- Reducing the impact of underwater noise on the marine environment of the Port of Cartagena. Project Link

Research Assistant | Technical University of Cartagena & MTorres February 2022 - May 2023

- Detection of carbon fiber wrapping failures using images from a profilometer.

Research Assistant | Technical University of Cartagena & | Hospital General Universitario Reina Sofía December 2019 - December 2020

- Automatic feature extraction of the optical nerve of both eyes by image processing and statistical pattern recognition for its integration in a telemedicine CAD (Computer-Aided Diagnosis) application.
- This work has been partially funded by Spanish National projects AES2017-PI17/00771 and AES2017-PI17/00821 (Instituto de Salud Carlos III) and regional project 20901/PI/18 (Fundación Séneca).

Technical Skills

Programming	Python, SQL
Development	XGBoost, Scikit-learn, Pandas, Numpy, Matplotlib, Seaborn, Keras, Tensorflow, Pytorch
Tools	Git, GitHub, PostgreSQL, Minio, MLflow, VSCode
Other	Docker, Kubernetes, Linux, Proxmox, Latex

Projects Involvement

Software Development

Reducing the impact of underwater noise on the marine environment of the Port of Cartagena.

Python, Docker, Docker-Compose, Minio, PostgreSQL March 2022 - Present

Technical University of Cartagena & EU Life Project

- The project consists on build a system based on microservices architecture that capture the date from diverse sources and stores it in a database backend.
- The system will be deployed in as a Docker-Compose and consist from a following modules:
  - **Data retrieving**: module that retrieves data from two hydrophones and AIS system and store it in a database.
  - **Data processing**: module that intake the data and process it to extract the noise level and associate it with the AIS data.
  - **API REST**: module that provides an API to access the data.

Machine Learning

Detection of carbon fiber wrapping failures using images from a profilometer.

Python, Keras, Tensorflow, RetinaNet Feb 2022 - May 2023

Technical University of Cartagena & MTorres

- The project involves building a model and its corresponding pipeline to detect carbon fiber wrapping failures using images from a profilometer. The project have the following stages:
  - Data analysis and preprocessing pipeline.
  - Selecting of the performance metrics.
  - Train RetinaNet model implemented in Python with Keras (Tensorflow backend) and hyperparameter tuning.
  - Model evaluation and final results.

Automatic extraction of optic nerve features from both eyes through image processing and recognition.

Python, Keras, Tensorflow Dec 2019 - Dec 2020

Technical University of Cartagena & Hospital General Universitario Reina Sofía

- In this project my task was to curate the dataset obtained from the Hospital General Universitario Reina Sofía and develope a DL-based APP that take two ocular fundus images to diagnose the glaucoma.
- The project is part of Automatic feature extraction of the optical nerve of both eyes by image processing and statistical pattern recognition for its integration in a telemedicine CAD (Computer-Aided Diagnosis) application.

Personal Projects

Kubernetes cluster building on Proxmox and managed with Ansible.

Ansible, Kubernetes, Proxmox, Docker

Personal

- In this project, my goal is to replicate a real-word scenario of deploying a Machine Learning model within a Kubernetes cluster. For this purpose, I have built a Kubernetes cluster on Proxmox, managing the VMs with Ansible. I am also use the Kubernetes cluster to learn new technologies such as Kafka, Spark, DeltaLake, etc. The cluster serve as a playground for me to learn new technologies and experiment with them.

PUBLICATIONS

Decision trees for glaucoma screening based on the asymmetry of the retinal nerve fiber layer in optical coherence tomography Jun 2022

MDPI DOI: 10.3390/s22134842

- **Authors:** Berenguer-Vidal, Rafael; Verdú-Monedor, Rafael; Morales-Sánchez, Juan; Sellés-Navarro, Inmaculada; Kovalyk Oleksandr; Sancho-Gómez, José-Luis.

Improving glaucoma diagnosis assembling deep networks and voting schemes Jun 2022

MDPI DOI: 10.3390/diagnostics12061382

- **Authors:** Sánchez-Morales, Adrian; Morales-Sánchez, Juan; Kovalyk, Oleksandr; Verdú-Monedero, Rafael; Sancho-Gómez, José-Luis.

PAPILA: Dataset with fundus images and clinical data of both eyes of the same patient for glaucoma assessment Jun 2022

Nature DOI: 10.1038/s41597-022-01388-1

- **Authors:** Kovalyk, Oleksandr; Morales-Sánchez, Juan; Verdú-Monedero, Rafael; Sellés-Navarro, Inmaculada; Palazón-Cabanes, Ana; Sancho-Gómez, José-Luis.

CONFERENCES

International Conferences

Analysis of the asymmetry in RNLF thinkness using sprectralis OCT measurements in healthy and glaucoma patients

May 2022

Springer DOI: 10.1007/978-3-031-06242-1_50

- **Name of the conference:** 9th International Work-Conference on the Interplay Between Natural and Artificial Computation
- **Location of the event:** Puerto de la Cruz, Tenerife, Spain
- **Date of the event:** May 31 - June 3, 2022
- **Authors:** Berenguer-Vidal, Rafael; Verdú-Monedero, Rafael; Morales-Sánchez, Juan; Sellés-Navarro, Inmaculada; Kovalyk Oleksandr.

National Conferences

Automatic Instance Segmentation Applied to Retinography for Optic Disc and Cup Segmentation

- **Name of the conference:** XXXVIII Annual Congress of the Spanish Society of Biomedical Engineering
- **Location of the event:** Valladolid, Castilla y León, Spain
- **Date of the event:** 25-27 November 2020
- **Organizing entity:** University of Valladolid
- **Authors:** Kovalyk, Oleksandr; Morales-Sánchez, Juan; Verdú-Monedero, Rafael; Sellés-Navarro, Inmaculada.

Application of mobileNet for early diagnosis of glaucoma: a binocular approach

- **Name of the conference:** XLI Annual Congress of the Spanish Society of Biomedical Engineering
- **Location of the event:** Cartagena, Murcia, Spain
- **Date of the event:** 22-24 November 2023
- **Organizing entity:** Technical University of Cartagena
- **Authors:** Kovalyk, Oleksandr; Morales-Sánchez, Juan; Verdú-Monedero, Rafael; Sellés-Navarro, Inmaculada; Sancho-Gómez, José-Luis.