

ALI EL HABCHI

SENIOR R&D / COMPUTER VISION ENGINEER

Personal Data

Place and Date of Birth: Oujda, Morocco | 29 September 1993
Address: 24 hectares sect 2 nr 65, 12000, Temara, Morocco
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Work experience

Current - August 2018 **R&D engineer (AI sensing and computer vision) at ATLAN Space, Rabat**

Worked on several software research and development projects, in particular by designing, training and deploying solutions for computer vision and deep learning / machine learning problems using Python, Java, C++, and frameworks like OpenCV, TensorFlow / Keras, Pytorch, and darknet. Designed and developed solutions for web, desktop and embedded applications using Java / JavaEE. Have also experience with C/C++ applications and OpenGL. Worked with Azure cloud solutions like Cognitive service and machine learning studio.

Key projects :

- Trained and deployed multiple solutions for object detection (obstacles, vehicles, persons, agriculture, etc) using YoloV3 / tiny, YoloV4 / tiny using darknet framework, YoloV5, YoloV7, YoloV8, Picodet, PP-Yolo, SSD using Pytorch. Inference deployment was using either OpenCV DNN inference engine on Jetson Nano and Jetson Xavier AGX or TensorRT/Onnx inference engines.
- Developed an Inference engine system based on TensorRT for backend (C++) and Java or python for front end using Named pipes / memory sharing.
- Trained and implemented various projects for object classification using Mobilenet, V2, V3, EfficientNet, Resnet, VGG16, using TensorFlow and ONNX runtime and/or OpenCV DNN for inference.
- Developed a solution for infrared / thermal water leak detection on drone using flir infrared sensor and OpenCV.
- Developed a solution for obstacle detection system based on optical flow algorithms and clustering using OpenCV.
- Developed a solution for obstacle depth estimation based on optical flow algorithms and multi view stereo using OpenCV.
- Designed and developed a Java-based solution for retrieving, processing, storing, and transmitting messages from the Iridium satellite network using AT commands, specifically for remote communication with drones BVLOS.
- Contributed to drone control software by modules for communication, sensing.
- Developed a system for camera gimbal orientation to given direction using IMU sensor and Onvif protocol.
- Worked on several projects of mapping/photogrammetry using Pix4D, OpenDroneMap, OpenSFM, OpenMVG, OpenMVS.

- Managed the Azure cloud portal and utilized it to deploy numerous virtual machines for various purposes such as training and testing deep learning models, simulators, communication and telemetry systems for drones, and creating webapps for websites.
- Developed a solution for target geolocation based on 3D calculation using OpenGL in C++, and later ported it to Java using LWJGL.

February -
July 2018

Software engineering Internship at ATLAN Space, Rabat

Concepting and developing of a web application in JavaEE for monitoring and managing drone missions / setup (JavaEE, jQuery, bootstrap, Bing maps, Hibernate, Shiro, Azure cloud)

July –
September
2017

Software engineering Internship at CHU, Oujda

Created an android mobile application in Java for monitoring diabetes patients daily diet with backend in PHP/Laravel.

Education

Since
August 2018

PhD candidate in Computer vision, **National school of applied sciences, UMP, Oujda**

Thesis: "Improving navigation of unmanned devices through the use of computer vision using Convolutional neural networks" Advisor: Prof. Toumi BOUCHENTOUF

July 2018

Master of Science in Software engineering, **Faculty of science, UMP, Oujda**

July 2016

Licence Degree in Mathematics and Informatics **Faculty of science, UMP, Oujda**

June 2011

Baccalaureate in "Biology and earth sciences", **Omar Ibn Abdelaziz high school, Oujda**

Scientific Publications

Zerrouk, Ilham, Younes Moumen, Wassim Khiati, **Ali El Habchi**, Jamal Berrich, and Toumi Bouchentouf. "**Evolutionary algorithm for optimized CNN architecture search applied to real-time boat detection in aerial images.**" Journal of Real-Time Image Processing 20, no. 4 (2023): 78.

El Habchi, Ali, Kaoutar Baibai, Younes Moumen, Ilham Zerouk, Wassim Khiati, Nourdine Rahmoune, Jamal Berrich, and Toumi Bouchentouf. "**Social distance monitoring using YoloV4 on aerial drone images.**" In E3S Web of Conferences, vol. 351, p. 01035. EDP Sciences, 2022.

Zerrouk, Ilham, Younes Moumen, Wassim Khiati, **Ali El Habchi**, Jamal Berrich, and Toumi Bouchentouf. "**CNN Adaptations for Boat Detection in Aerial Images Tested on Yolo v2.**" In 2020 International Symposium on Advanced Electrical and Communication Technologies (ISAECT), pp. 1-6. IEEE, 2020.

Khiati, Wassim, Younes Moumen, **Ali El Habchi**, Ilham Zerrouk, Jamal Berrich, and Toumi Bouchentouf. "**Grid Based approach (GBA): A new approach based on the grid-clustering algorithm to solve a CPP type problem for air surveillance using UAVs.**" In 2020 Fourth International Conference On Intelligent Computing in Data Sciences (ICDS), pp. 1-5. IEEE, 2020.

El Habchi, Ali, Younes Moumen, Ilham Zerrouk, Wassim Khiati, Jamal Berrich, and Toumi Bouchentouf. "**CGA: A new approach to estimate the geolocation of a ground target from drone aerial imagery.**" In 2020 Fourth International Conference On Intelligent Computing in Data Sciences (ICDS), pp. 1-4. IEEE, 2020.

Extracurricular Activities

Since 2019 Member of **Moroccan flying labs**, a part of international network of drone and robotics labs under **Werobotics** a non profit organization, worked as an instructor of drone piloting to Moroccan students.

Languages

Arabic: Mother tongue
English: Fluent
French: Fluent

Computer Skills

Programing: Proficient in Python, Java, C/C++, SQL, and JavaScript.
Skills: Machine learning, Deep learning, Data science, Computer vision, OpenCV, Tensorflow, keras, Pandas, Numpy, Pytorch, Onnx, TensorRT, Flask, Linux, System administration, Azure cloud, docker, AutoML, JavaEE, Spring, Hibernate.
Other: YoloV3, YoloV4, YoloV5, YoloV7, darknet, Azure cognitive services, Visual SLAM, photogrammetry, OpenGL, Android dev, web dev.

Interests and Activities

Deep learning, Computer vision, Cybersecurity, Robotics, Science
Drone piloting, Chess, Motorsports, Gaming