Axel MABROUK

32 years old
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Innovation Software Engineer - Phd

Expertise: Machine Learning & Data Science

(Freelance or Wage portage only)

EXPERTISE :

Machine learning	· ML/DL models design, training, evaluation, optimization, and deployment · Deep learning frameworks and libraries · Applications: 2D/3D Image processing, NLP and Speech recognition
Data Science & Engineering	· Data preprocessing, exploration, and statistical analysis · Data visualization and computer graphics · Data augmentation
Software Development	· Multiple programming language, frameworks and operating systems · Algorithmic modeling, design, simulation and debugging · High Performance Parallel Computing · Embedded, autonomous, and real-time systems

ACADEMIC BACKGROUND :

Period	**Degree**	**Specialty**	**Institution**
2016-2020	International joint supervision PhD	Signal, image, speech and telecommunications	Grenoble Alpes University Cadi Ayyad University
2010-2015	Engineer's degree	Embedded systems	ENSA Marrakech
2010	Baccalaureate	Mathematical Sciences	Technical High School - Azilal

TRAININGS/CERTIFICATION :

Machine Learning Specialization	Standford University
Deep Learning Specialization	Deeplearning.ai
CNRS – FIDLE training on deep learning	CNRS
English Advanced Level Certificate	American Langage Center
Signal-images: GPU architecture and programming	Gipsa-Lab
Computational Thinking and Data Science	MIT – open courses
Agile Development Certificate	University of Virginia - Online

PROFESSIONAL EXPERIENCE

Since 2021 — **Innovation Software Engineer - BlueOrtho (Grenoble)**

Topics	Deep Learning & Augmented Reality
Team	Innovation
Project 1 :	Automatic segmentation of medical images (CT):

- Data collection, pre-processing and analysis
- Study of DICOMs and detection of anomalies (metal implants, noise etc.)
- State of the art on existing segmentation methods
- Design and training of multimodal CNNs for bone segmentation
- Evaluation, optimization and deployment of models
- Presentation of results and reports editing.

Project 2 : Integration of augmented reality in orthopedic surgery:

- Technical evaluation of cutting-edge AR/VR devices
- Implementation of a real-time application on Google EE2 and Vuzix glasses
- Presentation of the prototype and study report editing

2021 2017 — **Research Associate - Gipsa-Lab (Grenoble)**

Project 1: Automatic generation of ground truth for road traffic scenes:

Topics	Computer Vision & Deep Learning
Team	COPERNIC: COntrol, PErception, Robots, Navigation and Intelligent Computing
Assignments	- Study of vehicle detection techniques - Design of a hybrid CNN model by exploiting spatiotemporal data - Training, evaluation and optimization of the model

Project 2: HEAVEN: Heterogeneous Architectures Versatile Exploitation and programming:

Topics	Computer Vision & Adequacy Algorithm Architecture
Team	AGPIG: Architecture, Geometry, Perception, Images and Gestures.
Assignments	- Development of an optimization guide for real-time vision algorithms on heterogeneous CPU-GPU architectures - Application to the GMM algorithm with integration of Compressed Sensing - Writing, publishing and presentation of scientific articles

2017 2015 — **Software Developer R&D - MaScir (Rabat)**

Topics	Computer Vision & Adaptation of the algorithms to architectures
Team	Embedded systems and AI
Project	MoVITS: Moroccan Video Intelligent Transport System:
Assignments	- Study of the computational load of the entire algorithmic chain of the project - Choice of the optimal hardware platform and implementation of the algorithms - Writing, publishing and presentation of scientific articles

SKILLS

TECHNICAL

Programming	Python, C, C++, Shell, Cuda, Java , C#/Unity, VHDL, ARM Assembly
IDEs & Tools	Pycharm, Visual Studio, Jupyter Notebook, Android Studio, SVN, SSH, Git, Beyond Compare
ML/DL frameworks	Tensorflow, Keras, Sikit-Learn, Pytorch, NLTK, Spacy
Data science & Engineering	Numpy, Pandas, Sqlite, Scipy, Pyspark, Dplyr And Tidyr, Selenium, Beautiful Soup, Scrapy
Data Visualization	Matplotlib, Bokeh, Seaborn, Plotly, Ggplot2, Streamlit
Image Processing	Opencv, Pillow, Scikit-Image
HW Architectures	Multicore Intel CPU, ARM, GPU, FPGA, DSP, ST And Microchip Microcontrollers
HW acceleration	Cupy, Numba, Psutil, Gputil, Pycuda, Cudf, Pynvml, Scikit-Cuda
Agile Tools	Teams, Jira
Office	Microsoft 365, LibreOffice, Latex

MATHEMATICAL

Scientific computing methods
Probability and statistics
Linear Algebra and Calculus
Optimization
Numerical analysis

LANGUAGES

English	Fluent
French	Fluent
Tamazight	Mother tongue
Arabic	Fluent
Spanish	Intermediate

INNOVATION

Methodology	From theory to synthesis, through exploration, modeling and simulation
Scientific watch	Relevant and quick bibliographic study about innovative topics
Rigor	Adoption of reliable methods and tools throughout the innovation process
Constructive hindsight	Critical, global and continuous review of solutions
Collaboration	Ability to cooperate with several partners to boost innovation
Communication	Production of high-quality documents (reports, articles, figures, presentations).