Abderrazak Chahid

Engineer , PhD candidate

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Artificial Intelligence & Embedded Systems

I am passionate about **artificial intelligence**, algorithm design for biomedical application and their integration using **embedded systems**, with strong technical, and interpersonal skills developed through work with different research labs and professional experiences.

Programming Skills

Matlab, Python, PyTorch, C/C++, VHDL, LabVIEW, Cadence, RTOS, μ-vision, KiCad, Altera Quartus II

Hardware Skills

ESP32, STM32, Altera FPGA, Xilinx FPGA, NVIDIA Jetson, CAN bus, SPI, UART.

Technical Skills

- Signal/ Images processing
- Algorithm design
- Feature generation
- Deep Learning (DL)
- Optimization
- Hardware design
- Parallel programming
- Real-Time OS
- Modelling/Control

Scholarship

In 2013, I was awarded an excellence scholarship to study the 3rd year of my masters at INSA od Toulouse, France

Languages

- ✓ Arabic (mother tongue)
- ✓ English (Advanced).
- ✓ French (Advanced)

Hobbies

- ✓ Football, Cycling
- ✓ Gardening
- ✓ Photography

Social media

- LinkedIn
- Twitter
- Github

List of Publications

- **A. Chahid,** R. Khushaba, A. Al-Jumaily, T.-M. Laleg-Kirati, "*A Position Weight Matrix Feature Extraction Algorithm Improves Hand Gesture Recognition*". 42st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2020.
- **A. Chahid**, et al, S. Alshebeili, T.-M. Laleg-Kirati, " *QuPWM: Feature Extraction Method for MEG Epileptic Spike Classification*", IEEE Journal of Biomedical and Health Informatics, 2020, doi: 10.1109/JBHI.2020.2972286.
- **A. Chahid**, et al, T.-M. Laleg-Kirati, " *Feature Generation and Dimensionality Reduction using the Discrete Spectrum of the Schrodinger Operator for Epileptic Spikes Detection*", 41st (EMBC), 2019.
- F. Albalawi, **A. Chahid**, et al, T.-M. Laleg-Kirati, and V. Bajic "*Hybrid model for efficient prediction of Poly(A) signals in human genomic DNA* ", Methods , 2018.
- **A. Chahid**, S. Bhaduri, et al, and T.-M. Laleg- Kirati, "*MRS Residual Water Suppression using the Squared Eigenfunctions of the Schrodinger Operator* ", IEEE Access, 2019.
- S. Bhaduri, **A. Chahid**, et al, S. Alshebeili, T.-M. Laleg-Kirati, H. Serrai, "*SCSA based MATLAB pre-processing toolbox for 1H MR spectroscopic water suppression and denoising*". Informatics in Medicine Unlocked, 18, 100294. https://doi.org/https://doi.org/10.1016/j.imu.2020.100294.
- **A. Chahid,** et al, *Adaptive method for MRI enhancement using squared eigenfunctions of the Schrodinger operator*. BioCAS 2017 IEEE (pp. 1-4).
- S. Jovanovic, **A. Chahid**, et al. (2016). *Shunt active power filter-based approach for arc fault detection. Electric Power Systems Research*, 11-21.

In progress

- M.A. Bahloul, M., **A. Chahid**, T.M. Laleg-Kirati, "*Fractional-order SEIQRDP model for simulating the dynamics of COVID-19 epidemic*". arXiv preprint arXiv:2005.01820.
- M.A. Bahloul, **A. Chahid**, T.-M. Laleg-Kirati, "*Artificial Intelligence-based Method for Carotid-to-Femoral Pulse Wave Velocity Estimation from Photoplethysmogram Signal* ", submitted to the 42nd (EMBC), 2020.
- F. Albalawi, S. Alshehri, **A. Chahid**, and T.-M. Laleg-Kirati, "*Cognitive state prediction using Voxel Weight-based feature*", submitted to

Patents

- **A. Chahid**, H. Serrai, T.-M. Laleg-Kirati, "*Magnetic resonance spectroscopy water suppression method and device* ", 2019. Patent No. PCT/IB2018/057899.
- **A. Chahid**, F. Albalawi, T.-M. Laleg-Kirati, "*Reduced feature generation for signal classification based on position weight matrix*", 2020, Patent application No. PCT/IB2020/051272
- **A. Chahid**, T.-M. Laleg-Kirati, " *Feature generation based on eigenfunctions of the schrödinger operator* ", 2020, Patent application No. PCT/IB2020/051275

Academic Qualifications

Ph.D. Electrical Engineering | King Abdullah University of Sciences and Technology — Jun,2020 Expected

- *Research mainly investigates feature extraction as one of the artificial intelligence pipeline. Specifically, signal processing-based feature extraction for biomedical signals for clinical application such as epilepsy diagnosis*

M.Sc. Electrical Engineering | Lorraine University, France — 2014

- *Novel single-phase active power filter for arc faults detection using Hardware In Loop (HIL) based on VHDL-AMS.*

International exchange scholarship | Institut National des Sciences Appliquées, France — 2013

- *Validate requirement management system by the design, implementation and documentation of crank test signals generator for the Engine Control Unit (ECU).*

M. SC. Electrical Engineering | École Nationale des Sciences Appliquées, Morocco — 2013

B.Sc. Electrical Engineering | Sultan Moulay Slimane University, Morocco — 2010

PhD Dissertation

In my PhD work, I explored the statistical signal/image processing-based algorithms (e.g. Quantum analysis, signal decomposition) in order to generate discriminative features for biomedical classification purposes. This concept has been used for different applications including: poly(A) prediction in DNA sequences and the different medical diagnosis using MEG, EEG, sEMG, fMRI, etc. I believe that artificial intelligence can participate in the revolutionizing different fields such as medicine and fully-autonomous systems such as smart aquaculture system.

Research Interest

- Signal processing-based features extraction for biomedical signals/images classification
- Technology integration of deep learning models using embedded systems (Autonomous systems).

Industrial Experiences

Prototyping a PLC controller of greenhouses — Jun-Dec 2019
Red Sea Farms, Thuwal, KSA

- PLC control of evaporative cooler, Integrate remote PLC control using web server.
- Build/implement of tomato life cycle in KAUST greenhouse.
- Participate partially in preparation of Asfan greenhouse for commercial production.

Design and prototyping of Crank sensor simulator — Feb 2014
CONTINENTAL AUTOMOTIVE, Toulouse, France

- Design crank signal generator based on differential amplifier. Fabricate the first prototype
- Write a specification document of the platform

Notable Projects

- *Development of NIOS II processor embedded on FPGA*
- *Design of 2,4 GHz oscillator using Cadence*
- Industrial project with Freescale: *Development of Door Control Module*
- Individual project: *Control robotic arm using LabVIEW*