Afulay Ahmed Bouzid

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BACKGROUND

- Ph.D. in Information Science and Technology 2015 2020 University of Miskolc (UoM), Miskolc, Hungary
- Master's in Electronic Instrumentation Engineering 2011 2013 USTHB, Algiers, Algeria
- Bachelor's in Electrical Engineering 2008 2011 USTHB, Algiers, Algeria
- Classic and Jazz (Theory and Performance) 2001- 2021

PROFESSIONNAL EXPERIENCE

- PostDoc Researcher. October 2022 Currently Polytechnique Montreal, Montreal, Quebec, Canada Department of Informatics.
- Laboratory Instructor. October 2022 December 2022 Polytechnique Montreal, Montreal, Quebec, Canada Department of Informatics.
- PostDoc Researcher. October 2021 October 2022 École de Technologie Supérieure (ÉTS), Montreal, Quebec, Canada Department of Electrical Engineering. NextGen project. The "new generation of avionics software defined radio" project for Communication, Navigation and Surveillance (CNS) called "NextGen SDAR" consists in developing and integrating avionics software defined
- radio modules (SDAM) in a single hardware unit via a robust architecture and optimized.
 Adjunct Professor. October 2020 Currently
 University of Miskolc, Hungary
 Institute of Automation and Infocommunication
 Teaching: Embedded Systems and Architectures, Communication Theory
 Supervision: Masters and PhD
 Research: Modeling and real-time implementation on FPGA of sensor preprocessing and navigation algorithms. New
 methods for pose estimation. Contributions to positioning, velocimetry and jerkmetry.
- Assistant Lecturer and Researcher. September 2018 October 2020.

University of Miskolc, Hungary

- Institute of Automation and Infocommunication Teaching: Embedded Systems and Architectures, Communication Theory Supervision: Masters Research: Modeling and real-time implementation on FPGA of sensor preprocessing and navigation algorithms. New methods for pose estimation. Contributions to positioning, velocimetry and jerkmetry.
- Guest Professor. October 2019 Sapientia Hungarian University of Transylvania, Marosvásárhelyi, Romania. Teaching: Embedded Systems and Architectures
- Teaching Assistant and Research Assistant. September 2015 September 2018 University of Miskolc, Hungary Institute of Automation and Infocommunication
 - Teaching: Embedded Systems and Architectures, Communication Theory
- Research & Development Engineer. August 2015 October 2016 HOSTAPLAST, Algiers, Algeria. Development of land vehicle security and tracking systems.
- Research assistant. November 2014 August 2016. École Nationale Polytechnique, Algiers, Algeria Design of a low-cost inertial station based on FPGA
- Research and Development Engineer. May 2014 August 2015 VERCLAM, Algiers, Algeria
- Design of an automated system for editing compact discs. • Lecturer. September 2013 – June 2014 Institut National Supérieur de Musique, Algiers, Algeria Acoustics
- Professor. December 2013- Mars 2014 Mokrani II High School, Algiers, Algeria Physique
- Violinist. July 2006 November 2014 Orchestre Symphonique National, Algiers, Algeria Occidental and North-African Classical Music

ABILITIES

- Expertise: Electronic Instrumentation, Sensors, Signal Processing, R&D
- Proficiency: Academia, Embedded Systems, FPGA, Supervision of research projects
- Competencies: Satellite Communication, Flight Instruments, Radio Navigation, SDR, Flight Tests, Autonomous Vehicles
- Software: Matlab/Simulink, Vivado/Vitis, Model Composer/System Generator, GitLab

PUBLICATIONS: Articles, Books & Theses

- Bouzid Ahmed, and József Vásárhelyi. "Lecture Notes and Practical Courses on System on Chip (SoC): Materials for Embedded Systems Subjects". ISBN: 978-963-358-238-1
- Reda, Ahmad, Bouzid Ahmed, and Vásárhelyi József. "Deep Learning-Based Automated Vehicle Steering." 2021 22nd International Carpathian Control Conference (ICCC). IEEE, 2021.
- Bouzid Ahmed, "New Methods for Pose Determination. Contributions to Positioning, Velocimetery and Jerkmetery", PhD on Computer Sciences and Technology Theses Dissertation, 2020.
- Kasem, Ashraf, et al. "A Survey about Intelligent Solutions for Autonomous Vehicles based on FPGA." Carpathian Journal of Electronic and Computer Engineering 13.2 (2020): 7-11.
- Zayer, Salam, et al. "Pragmatic Implementation of the Front-End of an N-bit/V ADC based on FPGA and FPAA." Carpathian Journal of Electronic and Computer Engineering 13.2 (2020): 12-15.
- Ahmad, Reda, et al. "Toward an embedded system for gesture recognition based on artificial neural network using reconfigurable target-case study and review." Multidiszciplináris Tudományok 10.4 (2020): 142-148.
- Bouzid, Ahmed, and József Vásárhelyi. "High Resolution Large Scale ADC. Case study of an N bit per Volt ADC Implemented using FPAA and FPGA Applied for Precision Altimetery." 2020 21th International Carpathian Control Conference (ICCC). IEEE, 2020.
- Bouzid, Ahmed, and József Vásárhelyi. "Implementation and experimentation of an embedded data acquisition/preprocessing system based on a hybrid reconfigurable hardware accelerator for inertial measurements." IEEE Transactions on Industry Applications 56.2 (2020)
- Ahmad, Reda, Ahmed Bouzid, and József Vásárhelyi. "Model predictive control for automated vehicle steering." Acta Polytechnica Hungarica 17.7 (2020): 163-182
- Bouzid, Ahmed, S. I. Boucetta, and J. Vásárhelyi. The PSoC 5 LP LABBOOK. 2018. ISBN: 978-6138436928 Boucetta, S., Z. C. Johanyák, and A. Bouzid. "Survey on Vehicular Ad-hoc Networks." Department of Industrial Engineering and Management Novi Sad, Serbia (): 168.
- Bouzid, Ahmed, and József Vásárhelyi. "Vehicular Acoustic Doppler Velocimetry based on Reconfigurable Analog and Digital Design." MultiScience -XXXII. microCAD International Multidisciplinary Scientific Conference
- Bouzid, Ahmed, and József Vásárhelyi. "Hardware acceleration design and implementation for inertial navigation applications." 2018 19th International Carpathian Control Conference (ICCC). IEEE, 2018.
- Bouzid, Ahmed, and József Vásárhelyi. "Survey About the PSOC5 LABBOOK." Vehicle and Automotive Engineering. Springer, Cham, 2018.
- Bouzid, Ahmed, and József Vásárhelyi. "Implementation of Dead reckoning solution on Zynq target." 2017 18th International Carpathian Control Conference (ICCC). IEEE, 2017.
- Bouzid, Ahmed, et al. "Pose Determination for Autonomous Vehicle Control." Vehicle and Automotive Engineering. Springer, Cham, 2017. 333-339. Bartók, Roland, et al. "Wall and Object Detection with FRI and Bayes-Classifier for Autonomous Robot." Vehicle and Automotive Engineering. Springer,
- Cham, 2017. 383-389.
 - Bartók, Roland, et al. "Embedded behavioral model implementation." 2016 17th International Carpathian Control Conference (ICCC). IEEE, 2016.
 - Bouzid, Ahmed, et al. "Implementation of INS/MAG/GNSS hybridisation technique for pose determination based on SoC and low-cost sensors: theoretical approach and synthesis." 2016 17th International Carpathian Control Conference (ICCC). IEEE, 2016.
 - Bouzid Ahmed, "Design and Implementation of a Platform for Acoustic Localization of a Sound Source with a Wireless Sensor Network", Master of Science. Thesis Dissertation, 2013

SUPERVISION OF ACADEMIC PROJECTS

Supervision of Masters and PhD students:

- (2018) Design of IoT Measurement Node based on Cypress PSoC
- (2020-2021) Multichannel Reconfigurable Voltage Attenuator
- (2020-2021) A New Analog to Digital Converter Exploiting Hybrid Reconfigurability
- (2020-) Model predictive control for automated vehicle steering
- (2021-2022) An Automated Tool for Generating Deep Neural Network IPs for Hardware Accelerators
- (2021-2022) Machine Learning based End-to-End Solution for Autonomous Cars

Research Projects

- Volumetric Ultrasound Tomography for Monitoring Energy Density and Viscosity
- Real-Time Impedance Control of a Microwave Chemical Reactor
- FPGA based Intelligent Solutions for Autonomous Vehicles
- Control System for Center of Mass Monitoring Applied for Balance Rehabilitation and Performance Enhancement
- New Methods for Pose Determination. Contributions to Positioning, Velocimetery and Jerkmetery.
- Real-time implementation of a Jerkmeter on low-cost FPGA.
- A Novel High-Resolution Large-Scale ADC; The N-bit/V ADC
- Novel Data Preparation Technique for Inertial Measurements
- Hybrid Reconfigurable Solution for Speed Estimation based on Ultrasonic Acoustic Doppler velocimetry
- Artificial Neural Network based Motion Type Recognition System
- GPS-free positioning from acceleration measurement using EKF
- Design and Implementation of a Platform for Acoustic Localization of a Sound Source with a Wireless Sensor Network
- A Monitoring System for Liquid Industrial Wastes
- A Natural Gas Detector
- An ECG Signal Conditioner
- ECG Signal Denoising using DWT

LANGUAGES

- English Fluent.
- French Fluent.
- Darija Fluent.
- Tamazight (Berber) Mother Tongue.
- Arabic Intermediate
- Hungarian Beginner