MAHDI ELHAG
Mechatronics Lead Engineer & ISTQB Certified SW Tester

Personal Info

Full Name	|	Mahdi Abdelazim Abdalla Elhag
Website	|	https://mahdielhag.com
Email	|	mahdi.abdelazim@gmail.com
LinkedIn	|	https://www.linkedin.com/in/mahdiabdelazim/
Service Area	|	Europe

O Overview

I'm a mechatronics lead engineer and an ISTQB certified tester with +8 years of experience from 2016 in control engineering, embedded software, powertrain systems, and data analytics. Besides my technical competencies, I'm very motivated to solve complex problems in all types of systems. I can work in a team or manage a group to complete objectives in my areas of expertise. I'm technically involved in all the fields above as a problem solver. My proposal-power is the key to success in realizing my ambitions.

W Work Experience

Concept Development Engineer (MIL, SIL, HIL, PoC)   06/2022 - Present
- Integrating powertrain components & controls in AVL CruiseM & GT-Suite.
- Generating code to target real-time PCs such as ETAS and dSPACE.
- Creating machine learning models and deploying them to real-time PCs.
- Performing software regression and release tests on virtual testcells.
- Upgrading real-time simulation libraries in C/C++ for specific cases.

Powertrain Team Leader (OBD, EAS, SW, CAE, Aftersales)   01/2020 – 05/2022
- Performing reverse engineering on existing vehicles to produce models.
- Auditing calibration compliance to emission standards Euro5 to Euro6.4.
- Technically leading the flying doctors (aftersales OBD team) in Morocco.
- Automating HIL tests for diagnostic requirements for Euro6.4 regulations.
- Analyzing EU & NA cycles for IUPR & EAS root causes using AVL Concerto.
- Managing hot test missions on the field in Morocco & planning for Spain.
- Writing offers to answer clients' RFQs related to OBD and EAS calibration.

Controls Engineer (Senior & Lead in Methodology)   07/2017 – 01/2020
- Executing V&V plans for air monitoring through VGT, throttle, and EGR.
- Calibrating OBD functions: engine protection, misfire, DOC, DPF, SCR.
- Developing HIL systems & DoE for diagnostics and software validation.
- Developing driveability evaluation tools based on acceleration sensors.
- Modeling ICE in AVL Cruise M & Ford Tourneo in AVL VSM for HIL usage.
- Programming standalone .NET application to interface CAN massages.
- Bosch MED17.0.1 Rapid-Prototyping Using ETAS E-Hooks/ATI NoHooks.

Mechatronics R&D Engineer (Automotive SW)   06/2016 – 07/2017
- Executing the V-cycle by converting business requirements into functional requirements for CNG mono-fuel engines on Renault Trucks.
- Implementing functional requirements as C codes for Freescale MPC5554 32bit, working in a team of 3 engineers supervised by a lead engineer.
- Calibrating engine performance/consumption functions & iterating in requirements level & software level, from desk to bench and back to desk.
- Reverse engineering Bosch functions such as misfire, knock & sensor emulation to implement on Monro's ECU, with adaptations to CNG.
- Running engine dyno & chassis dyno tests to evaluate controls and SW.

E Education

M.Sc. in Mechatronics Engineering (3.57/4.00)

Yıldız Technical University | Türkiye
2016 – 2018
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B.Sc. in Mechatronics Engineering (3.45/4.00)

Yıldız Technical University | Türkiye
2013 - 2016

S Skills

Powertrain Calibration & Testing
- Diagnostics, Aftertreatment, NVH
- Performance/Consumption, PoC

Embedded Systems Software
- Freescale MPC5554 & ARM M4 STM32F303
- AUTOSAR & Software Reverse Engineering

Software/Firmware Development/Testing
- C#, Java, Python, C/C++, SVN

Project Management
- MS Project, Startups Finance, SAP

Computer Aided Design/Engineering
- Real-Time Software: ETAS LABCAR, dSPACE SCALEXIO, FreeRTOS, Linux Ubuntu
- Model-Based Design: MATLAB, SIMULINK
- PCB Design & Simulation: Proteus, Multisim
- SW Development: JIRA, PTC Integrity, ADD, IBM DOORS, MISRA-C, Embedded Coder
- Rapid Prototyping: ETAS LABCAR, dSPACE
- Calibration: ATI NO-HOOKS, ATI VISION, ETAS INCA, ETAS EHOOKS, ETAS INTECRIO
- AVL Tools: Creta, Concerto, Cruise M, Cameo, Model.CONNECT, DRIVE, Maestra
- CAN Tools: CANalyzer, CanKing, CANoe
- Mechanical Systems: SolidWorks, AutoCAD

Communication Protocols
- TCP/IP, UART & Modbus RTU/ASCII/TCP
- CAN-Bus (Kvaser & Vector)
- **Standardization & Quality**
ISO26262 – ISO16949 – ISO9001 – ISO12213

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P | Projects Realized

Concept Development Engineer **2022 - Present**
- HIL Concept Development & Integration based on ETAS & dSPACE HW
- Heavy-Duty HIL Systems' Real-Time Simulation & Performance Assessment
- Open-Loop & Closed-Loop Commissioning for MIL/SIL/HIL Platforms

Powertrain Team Leader **2020 - 2022**
- PSA Citroën AMI ONE BEV (Inverse-Engineering, Systems, SW, Certification)
- PSA EP6FADTX PHEV & EB2ADT E6 Petrol (Diagnostics, EAS, Perfo/Consu)
- Renault 48V E-Tech MHEV (Systems & Requirements, Battery Simulation)

Controls Engineer (Senior & Lead) **2017 - 2020**
- PSA DV6DR E5 Diesel (Diagnostics)
- PSA DV5RUC E6.2/E6.3 Diesel (Diagnostics)
- Bosch MED17.0.1 Rapid-Prototyping Using ETAS E-Hooks/ATI NoHooks
- Ford 1.5L & 2.0L E6 Diesel & Petrol (Diagnostics, HIL Simulation, Driveability)
- R&D (Modeling Diesel Oxidation Catalyst Temperatures Using LSTM RNN)
- R&D (Cost-Effective Virtual Testbed System for Calibration Applications)
- R&D (ATI VISION-Integrated Acceleration Sensor for Driveability Evaluation)

Mechatronics R&D Engineer. **2016 - 2017**
- Diesel to CNG Mono-Fuel Projects (Renault Trucks 7.7L DTI 8, Fargo Askam AS 32.260 LN, Mercedes-Benz 4.8 L OM924 Engine)
- Diesel to CNG Dual-Fuel Projects (Mitsubishi Triton L200, Mitsubishi Canter)
- LPG/CNG/LNG Multi-Fuel Kits (Opel Astra, Toyota Corolla, Honda Civic)
- Manual Coding of Misfire Diagnosis in CNG Mono-Fuel ECU Project
- R&D (Optimized Multipurpose Mono-Fuel/Dual-Fuel ECU Test System)
- R&D (Diesel/CNG Dual-Fuel Pedal Reduction Actuator System Firmware)
- R&D (ESP8266 Remote Recorder for After-sales Vehicle Real-Time Signals)

P | Publications & Patents

- Elhag M.A.A., Najoui M., Jbari A. "*Hardware-in-the-Loop System for Electronic Control Unit Software and Calibration Development*". Book Chapter: Smart Embedded Systems and Applications. ISBN: 9788770227728
- Elhag M.A.A., Arslan M.S., "*Modeling Diesel Oxidation Catalyst Upstream and Downstream Exhaust Gas Temperatures Using LSTM RNN*". https://doi.org/10.1109/CEIT.2018.8751798
- Mahdi E., Egemen K., Tufan K. "*Replacing Hardware Components in HIL Platforms by a Firmware Manipulation Technique to Create a Portable Cost-Effective System*", Turkish Patent Institute, 11.01.2019, No: 2019/02820

T | Training & Courses

- 2023 – Control System, Optimization and HIL Simulation (Udemy)
- 2022 – Hydrogen Internal Combustion Engine: Intro to Design (Udemy)
- 2021 – Electric Vehicles and Mobility, Ecole des Ponts ParisTech (Coursera)
- 2020 – Project Planning & Management, University of Virginia (Coursera)
- 2017 – Autonomous Navigation for Flying Robots, TUM (edX)
- 2016 – Digital Systems, Universitat Autònoma de Barcelona (Coursera)
- 2015 – Image and Video Processing, Duke University (Coursera)
- 2014 – Machine Learning, Stanford University (Coursera)
- 2014 – Introduction to Thermodynamics, University of Michigan (Coursera)
- 2012 – Volkswagen Service Maintenance Program, Sudan (3 months)

R | Reference

Mehmet Salih Kurt
Sn. Firmware Engineer/ Career Mentor
Arm Ltd. @ Cambridge, UK
Address: Cambridge CB1 9NJ, UK

Dr. Mehmet Selçuk Arslan
Associate Professor / Thesis Advisor
Yıldız Technical University @ Istanbul, Türkiye
Address: E2-219, YTU Besiktas Campus, Istanbul

E | Expertise
- Powertrain Controls/Calibration
- Software Development/Testing
- System Reverse Engineering
- Electric/Electronic Design
- R&D Project Management

A | Awards

Highest CGPA in Mechatronics Department
Yıldız Technical University | Istanbul, Türkiye
Year : 2016

Turkish Undergraduate Scholarship Holder
Ministry of Foreign Affairs| Ankara, Türkiye
Year : 2013

Highest CGPA in Mechanical Engineering
University of Khartoum | Khartoum, Sudan
Year : 2013

Sudan's 84th Highest Achiever Countrywide
Ministry of Education | Khartoum, Sudan
Year : 2011

L | Languages
- Native | Arabic
- Fluent | English > IELTS (7.0)
- Fluent | Turkish > TÖMER (C1)
- Fluent | French > LGC (B2)

M | Memberships

Official U.S. List of Certified Software Testers
AT*SQA | ISTQB
Since Year : 2024

The YOCTO Project
The Linux Foundation
Since Year : 2014

Outstanding Students Forum
University of Khartoum
Since Year : 2011

H | Hobbies
Writing Poems & Debating Articles
Hiking, Travelling & Cultural Exchanges
Home Automation & IoT Devices