Raif Karaahmetoğlu

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Skills

- Matlab/Simulink | C | C++ | Python | JavaScript | CSS | HTML | React and Router | MUI | OOP | SOLID | Unit Testing
- CATIA | CarMaker | GT-SUITE | AVL Puma | AVL Concerto | AVL Testbed.Connect | AVL Model.CONNECT | AVL fmi.lab
- Jira/ Confluence | AWS | Docker | GIT | GitHub CI/CD | TeamCity | Microsoft TFS | Scrum / Agile | Enterprise Architect

Experience

Software Development Engineer — AVL MTC Motortestcenter AB — *Stockholm, Sweden* — **09/2024 - Current**

- Contributed to a Python-based mapping application that generates drivable areas using LiDAR and GPS data, enabling autonomous non-road mining vehicles to navigate safely within mining fields. Automated the project build and installation process through CI pipelines. Redesigned the threaded data download procedure. Introduced a new UI architectural pattern by separating the interface from the logic. Ensured auxiliary C++ projects comply with MISRA C++ 23 standards at Scania.
- Conducted systems engineering activities for auxiliary functions of hauler vehicles — including windscreen wiper control and IMU self-calibration — over a three-month period at Volvo Construction Equipment.

Application Development Engineer — AVL List GmbH — *Istanbul, Türkiye* — **07/2018-09/2024**

- Successfully integrated the GEM virtual model into a real power-pack (engine and transmission) test rig to comply with CFR 1036-1037. Restructured the model framework, adapted the parameterisation process and implemented automation and safety enhancements to the test rig. Pioneered new methodologies in GEM, fostering the growth of team skills across multiple projects.
- Modernised the ISAC vehicle simulation library by developing contemporary vehicle architecture models. Overcame challenges such as integrating a no-slip model and ensuring stable vehicle ECU development. Increased ISAC's position in the real-time simulation market, contributing to annual revenues of approximately €5 million.
- Developed advanced vehicle subsystem models for the Route Studio project using Python. Implemented key design patterns to provide a robust and structured code base.
- Integrated and performed a major refactoring of the Model Factory project within the Route Studio framework, enabling the identification of battery model parameters through road data analysis, thereby reducing reliance on battery test cycle data.
- Restructured, enhanced and integrated the probabilistic Real Driving Emissions (RDE) cycle generation algorithm into the Route Studio project.
- Contributing to the Functional Mock-Up Interface (FMI) module for reading FMU models. Developing the Model.Connect (MC) module for generating FMU models which do real-time monitoring and signal state transfer via web sockets in VTS project.
- Developed automated HIL project creation module using the COM API interfaces of the dSPACE tools ConfigurationDesk, ControlDesk and Bus Manager.

Electronic Design Supervisor — Hema Endüstri A.Ş. — *Tekirdağ, Türkiye* — **08/2016-02/2018**

- Coordinated negotiations with product development companies to collaborate on the development of an electro-hydraulic steering control unit.
- Managed the Test Systems Department which included a wide range of test benches from hydraulic systems to transmission units. Successfully re-commissioned all non-functional benches, restoring them to full operational capability. Established key guidelines for the development of new test benches, mitigating problems such as incorrect component selection, complex wiring, unmarked cables, signal interference and convoluted algorithm design. Provided mentoring to test engineers, facilitating their skills development. Over a one year period, recommissioned all previously inoperable test benches, representing 66% of the total, restoring the test system to peak efficiency.
- Led the project management including requirements gathering and meticulous documentation for the Bluetooth controlled electro-hydraulic lift project. Achieved successful project completion and showcased the system at various exhibitions, highlighting our company's capabilities in electronic system development.
- Designed vehicle dynamics models specifically focused on steering system dynamics for hardware-in-the-loop (HIL) simulators.
- Successfully delivered a prototype of an automatic guidance system and its control algorithms tailored for agricultural vehicles within an ambitious timeframe of less than a month, despite tight deadlines. This involved a range of tasks including Lat-Long to UTM conversion, development of upper and lower level control algorithms and implementation of a hydraulic valve controller. The application level algorithms were created using Matlab/Simulink and then translated into C code using an embedded coder tool. The lower level code was developed directly in C and seamlessly integrated with the converted algorithms, embedded on a TI TMS570LS4032 processor.

R&D Engineer — Tümosan A.Ş. — *Istanbul, Türkiye* — **10/2013-01/2015**

- Preparation of a project aimed at developing control algorithms for diesel engines. The project was accepted by the Turkish Research Agency TEYDEB and funded with a budget of €1.5 million. The budget was used to set up the company's control and electronics infrastructure, which included the necessary software and electronics tools and equipment to set up a control and electronics laboratory.
- Development of mean-value and zero-dimensional simulation models for diesel engines. Established key expertise in modelling techniques for real-time engine simulation models within the company.
- Managed the seamless integration of basic electronic control units into diesel engines to ensure compliance with Stage 3B emissions regulations.
- Managed a small team of control system engineers to achieve objectives.

Electromechanics Design Engineer — Otokar A.Ş. — *Sakarya, Türkiye* — **03/2012-08/2013**

- Designed the mechanical infrastructure for turrets and remote-controlled weapon stations (RCWS) mounted on ground defence vehicles. A significant achievement was the successful design and integration into the company's product portfolio of a compact yet sophisticated machine gun turret, known as UCOK.

Volunteer Researcher Mekar Laboratory *Istanbul, Türkiye* **06/2010-08/2011**

- Developed semi-autonomous car infrastructure, mathematical model and longitudinal control algorithm to participate and compete in the Grand Cooperative Driving Challenge in the Netherlands.

Education

Master of Science Istanbul Technical University *Istanbul, Türkiye* **2009 - 2011**

- Major in Mechatronics Engineering - GPA 3.63/4

Bachelor of Science Osmangazi University *Eskişehir, Türkiye* **2004 - 2009**

- Major in Mechanical Engineering - GPA 3.23/4

Publications

- Cooperative Adaptive Cruise Control Implementation of Team Mekar at the Grand Cooperative Driving Challenge, IEEE Transactions on Intelligent Transportation Systems (Volume: 13, Issue: 3, September 2012).
- Design and Control Basics of a Cooperative Vehicle, 6th Automotive Technologies Congress – OTEKON 2012, Bursa.
- Car Following with Adaptive Cruise Control Evaluated in Istanbul City Traffic Conditions, 7th Automotive Technologies Congress – OTEKON 2014, Bursa.

Others

- High Honor Student - GPA 3.86 (2007-2008 Spring Term)