ALI SAHBAZ

Senior Embedded Software Engineer
C++ Developer

Mail: ali_sahbaz@outlook.com
Contact Phone: +90-534 845 20 88
Github: [goto_my_github]
Linkedın: [goto_my_linkedın]
Adress: Turkey / İstanbul / Kocaeli

OBJECTIVE

I have actively participated in various innovative projects throughout my university and professional life. My main motivation in business revolves around problem-solving and the implementation of new products and ideas. More importantly, I value the knowledge and experience gained through these efforts, regardless of whether the goals are fully achieved.

In my work experience so far, I have had the chance to gain experience in many large projects. I participated in various stages of product development, including software, hardware, mechanical design, high-level software, commissioning, testing, and monitoring. I gained technical expertise in both software development and production stages. Additionally, I honed my social skills by assuming important upper-level tasks such as intra-team communication, customer relations, and technical process management.

For me, C++ serves as a profound source of motivation. I perceive modern C++ not only as a programming language but also as a genuine artistic tool. With each new version (C++14/17/20 and beyond), I feel like new colors and tones are added to the C++ palette. This evolutionary process resembles a journey that only those driven by passion can understand. 😊

My mission is to specialize in embedded/OS, design patterns, software, electronics, mathematics, geometry, and physics to contribute to the technologies that will shape the future.

TECHNICAL

My Experienced Tittles: **Firmware development, Software development, GUI development, API development, C/C++ development, Architectural designs, UML designs, Documantations, Test processes management, Customer relations and business planning management, Technical Team Leading, Scrum Master**

Programming languages I have experience with: **C, C++, C#**

MCU's I have experience with: **Arm Cortex Families, STM32F0/F1/F3/F4/F7/H7 + Dual Core experience, TI CC2540/CC1312 / MSP430 / TM4C129, Arduino, ESP32**

Single Board Computers I have experience with: **STM32MP1, Beaglebon Black (Debian GNU/Linux), Rasperi Pi, NXP S32G2**

Development environments I have experience with: **IAR , Keil, CCS, Eclipse Base other IDE's, Visual Studio / Visual Studio Code. (CMake)**

Operating systems I have experience working on the MCU side: **FreeRTOS, AzureRTOS, Bare Metal / Super Loop, ASOS(Framework I developed myself)**

Experienced frameworks: **ETL(Embedded Template Library) , STL(Standart Template Library) , SDL(Simple DirectMedia Layer) , RTOS(FreeRTOS , Azure RTOS) , Zephyr , Embedded Lua , WxWidgets , OpenCV , OpenGL, QT Framework**

Individually, these are the subjects I most enjoy reading and working on: **Design Patterns, Operating Sytems, Image Processing with OpenCV, DSP, High Frequency Trading(C++) , Rendering/Game Development(OpenGL), Autonomous driving / mathematics-physics, Modern C++ new features 17/20/23...**

Other Experienced Keywords: **Cmake, Jira, Github, TDD, Stade machines, Event driven architecture, WebSocket, Networking, QP(real-time embedded frameworks - Miro Samek), Agile , OOP, SOLID, Autosar, SixStep BLDC Motor Control , FOC-AC Motor Control(Qorvo), bootloader, Fw Update, Special Protochol design, JSON, low power**

Experienced Comminications Keywords: **Wi-Fi, GSM/GPRS, GPS, BLE, OpenThread(my favorite), RF 433MZ(TI CC1200), USB, Ethernet(LWIP), CAN, UART, SPI, I2C, USART, RS232, RS422, RS485, one-Wire etc..**

Experienced Sensors Keywords: **IMU sensors, Accelerometers, Lidar(RpLidar), Radar(TI AWR1243), Ultrasonics , PIR , Capacitive , Detection, Temperature, Encoders, Current etc...**

Technical features that I am weak in but will improve on: **Embedded Linux, Yocto/BuildRoot, CI/CD, Linux, FPGA's**

WORK EXPERIENCES

SAYKAL — *Senior Embedded Software Engineer*

JUL 2020 - Now

Descriptions: We develop industrial and automotive projects. I undertake many technical, social and task completion roles such as software development, coordination of hardware and software teams, customer and production planning. When I first started to SAYKAL, we were a startup of 10 people. Now, we have grown more than 20 times and become a global player with our own production line and a large R&D department.

Roles :

- Firmware/Software Developer.
- High Level Software / Hardware teams Coordinator.
- Team Leader. / Scrum Master. (More than 5 employees)
- Business development/analyst and Production planning support
- Writing clear, maintainable, and scalable code
- Tubitak projects presentations / customer presentations introductions

ASİS — *Embedded Software Engineer*

JAN 2019 - JUL 2020

Descriptions: We developed Robotic/IOT and industry(Fuel automation systems projects) projects. I worked as a software engineer in a team of 10 people. I gained many challenging engineering experiences.

Roles :

- Firmware/Software Developer.
- GUI software developments for test and production. Documentations / Prototyping.

ENELSAN — *Embedded Systems Engineer*

JUL 2018 - JAN 2019

Descriptions: We developed different types of hardward & softwares for Industrial automation and measurement systems projects.

Activities

- Firmware/Software Developer & Hardware PCB/schematic designs

FREELANCER

JUL 2018 - Now

Descriptions: Together with my hardware, software and mechanical design team, we provide special products/software development and consultancy services for private customers.

Roles :

- Procuct Developer.
- Consultancy.
- Self Learner.

PROJECTS

SAYKAL - ADAS Domain Controller

It is our company's long-term vision project. Our Tubitak project. One of the main goals of our company is RADAR technologies. It is a project that emerged as a platform that enables the operation/testing of these products. It is aimed to provide in-vehicle integration and support to the driver by developing control software that makes decisions with camera lidar and other sensors. [LINK]

Key activities:

- App Develop with C++.
- Lead Team (4 software employees)
- New Project, experience and learning process continues.

Keywords: NXP S32G2 , Embedded Linux, Multi Core, 20xCan , 5xETHERNET , Radar , Lidar, Camera, Networking

SAYKAL & FKT & MAN | SMART SEAT

Smart seat control and tracking control gateway. Subheadings: Seat heating, cooling, presence detection, Logging, Keypad, massage motor control, Mobile application, GUI, Wired (CAN) wireless (OpenThreat) installation. Seat phone USB charging, wireless charging. [LINK_MAN] [LINK_FKT]

Key activities:

- Firmware & App Developed with C++.
- Lead Team (2 hardware - 4 software employees)
- 6 different pieces of product.

Keywords: Thread , Wifi , CAN , I/O , USB , FirmwareUpdate , SPI Flash , I2C Temp , Bhi160 IMU , Motor Control , Json , SD card , Mobil app, Arm Cortex

ME | ASOS - Ali Sahbaz OS Framework

I created my own framework using the studies and readings I have done over the years. I created a C library that contains both operating system features, sensor drivers and algorithms. And I built a modular, portable, strong structure that includes many design patterns. We can say that it is a Zephr-like structure. You can see small parts of the sample on my github account.

Key activities:

- Software Developed with C

Keywords: Design patterns, OS, sensor drivers, Algorithms

SAYKAL & HELİOSTEAM | Controller + Gateway

I mentored the software team of the energy production facility project with our sun-tracking mirrors, for which our company has been doing R&D for more than 10 years. [LINK]

Key activities:

- Lead Team (2 software employees)

Keywords: Motor control, C++, RF, Smart solar detection and tracking algorithm, precise angle calibration algorithm, mesh networking, rs422, Ethnernet, PLC, Energy automation

SAYKAL | GENERIC GATEWAY

It provides transparent data transfer with many communication ports for all applications. All desired configurations are provided with an easily programmable, interactive UI.

Key activities:

- Firmware & App Developed with C++.

- Lead Team (1 hardware - 2 software employees)

Keywords: Smart UI, GSM, GPS, RS422, RS232, WIFI, BLE, CAN, RF, USB, Ethernet, Arm Cortex H7, Networking, QT Framework

SAYKAL & COWEALTHY | Smart Cow Earring

Smart earring for cow health and monitoring. Subheadings: wireless charging, motion tracking and cow estrus detection. Communication via RF. Animal temperature monitoring. Integration into smart barn system.[LINK]

Key activities:

- Firmware & App Developed with C++.

- Lead Team (2 hardware - 2 software employees)

Keywords: RF 433Mhz , FFT , FirmwareUpdate , Accelerometer , Temp , CC1312

SAYKAL & COWEALTHY | Smart AC FAN Motor Driver

Ventilation and irrigation system of large farms. Subheadings: Wireless communication, mobile app, air conditioning, AC Motor control (Qorvo Driver). FAN Propeller length can be up to 4 meters (High Current), Integration into smart barn system.[LINK]

Key activities:

- Firmware & App Developed with C++.

- Lead Team (1 hardware – 2 software employees)

Keywords: Qorvo, ESP32 Gateway + Arm Cortex M4 MCU, AC Motor , Vibration, engine health detection , FirmwareUpdate , Accelerometer , Temp

SAYKAL & TOGG | OHC

Overhead Console lighting system. In-car integration. In this project, I was the guiding leader, not the developer.

Key activities:

- Lead Team (1 hardware – 2 software employees)

Keywords: Elmos e52139 , Series production, LIN , CAN , RGB Led

SAYKAL | BELTCHECK

While your vehicle is in motion, which seat has a passenger belt fastened and which seats are empty; You can get information about how many passengers your vehicle carries during the cruise, how long it takes to complete its course, and at what speed in which time zone it is cruising. The project was developed with my 5 teammates. [LINK]

Key activities:

- Firmware & App Developed with C++.

- I was software teamlead

- Production tests and necessary software processes. (GUI with QT framework)

- Integration with the buses and hardware processes.

- openThread protocol was used for wireless communication of the seats, CAN was used for wired and related communication design was made.

- PAL/NTSC screen design was done with pixel by pixel LTDC. In parallel, touch screen support was provided.

Keywords: Thread , Wifi , CAN , I/O , USB , FirmwareUpdate , SPI Flash , I2C Temp , Bhi160 IMU , PAL/NTSC , LTDC , Json , SD card , external RAM process , image process, image render, STM32WB , STM32H7 , QT Framework

SAYKAL & YOLCU360 | UseAndLeave

A car sharing project that meets your car rental needs per minute and allows you to pay as you go. Embedded software, hardware, mechanical and assembly is our responsibility. I was leading a team of 5 people including hardware and mechanical developers.

Key activities:

- Communicating with the car and providing the necessary controls.
- To transmit location information and necessary conditions to the server.
- Integration with the car and hardware processes.
- Related ECU embedded software architecture design with C++.
- Project processes tracking and integration and production process management.
- Production tests and necessary software processes for production.
- Field tests and management of feedback.

Key words: GSM/GNSS , HTTP/HTTPS , GPS , WIFI / BLE , CAN , I/O , USB , FirmwareUpdate , TCP/IP , SPI Flash , I2C Temp , Bhi160 IMU , Car can analyze

SAYKAL & ILOS | SmartCargomat

Smart cargo lockers for cargo companies. It provides integrated cargo tracking with smart mobile application and website. I was leading a team of 7 people including hardware and mechanical developers. [LINK 02]

Key activities:

- Cabinets (> 120) I/O control manager algorithms.
- Integration with server.
- Related hardware embedded software architecture design with C++.
- Project processes tracking and integration and production process management.
- Production tests and necessary software processes.

Key words: Ethernet , TCP/IP , JSON , GPS , WIFI / BLE , RS485 , I/O , USB , FirmwareUpdate , SPI Flash , Cabinets mash network manage , Arm Cortex M4

SAYKAL & BEVESE & VISIOBIT | AGV

Automated guided vehicle. The project carried out with the partnership of 3 different companies. Embedded software is our responsibility. I was leading a team of 3 people. [LINK 01] [LINK 02]

Key activities:

- AGV communication integration with server. (special protocol layer)

- Embedded software architecture design with C++. Each AGV includes 2 DC Motor Drivers and 1 Gateway hardware. AGV have lidar, distance sensors, QR reader, magnetic line sensor, encoders, IMU, relays, hydraulic motor etc

- Production tests and necessary software processes. (Test GUI with C#)

Key words: Wifi , TCP/IP , SPI , CAN , I2C , RS232 , Arm Cortex M4, Industrial Sensors, Dc Motor control algorithms with encoders, Line follower, QR Maping , PID Controls with more then one layer, QT Framework

SAYKAL | HPAS

High Precision Accelerometer Sensor. HPAS can be used in different applications. They can be used in vibration monitoring, strong ground motion detection, automotive test applications, telecom, industrial manufacturing processes in every sector. It is also a defense project supported by TUBITAK to ensure border security. The project was developed with my 3 teammates. [LINK]

Key activities:

- Firmware Developed with C++. Precise acceleration measurement and filters.

- Production tests and necessary software processes. (GUI with QT C++)

Key words: Ethernet, JSON , GPS , MEMS , SPI , CAN , I2C , USB , RS422 , Arm Cortex M7&M4 Dual Core DSP, Real time 'TIME' synchronization with GPS PPS signal, Kalman filter

ASIS | TARO

The aim of the project is to prevent heavy workers traffic and product search confusion in e-markets. A human rides on it then detects the closest route with Path Finder and it goes autonomously to products. The project was developed with my 15 teammates. [LINK]

Key activities:

- Main gateway Firmware Developed with C++. This gateway takes all sensor and other ECU information from the environment, converts it to a specific protocol and transfers it to the Main Board.

- A Star algorithms , studies on autonomous movement.

Key words: Embedded Linux, CAN , Arm Cortex M3, Rs232,Rs422,Rs485,OneWire etc..

ASIS | NVU & IOTBOX

It is a functional IOT project that can talk to any device, perform operations, create control mechanisms that we have determined within ourselves, and extract all the data we want to the server layer with this script by sending the script language we customize within ourselves. It is also a vehicle tracking system. The project was developed with my 3 teammates. [LINK]

Key activities:

- Firmware developed in C++.

- Test GUI with C#.

Key words: Embedded Lua Script , TCP , JSON , GSM , GPS , Arm Cortex M3 , USB , Can , Rs232 , Rs485 , OneWire, Firmware Update, web server

ASIS | Smart Carboy

The IOT device we designed to provide remote monitoring of water dispensers and to place orders automatically. The project was developed with my 2 teammates.

Key activities:

- Firmware developed in C++.

- Phone app comminication integration with BLE.

- Capacitive water level measurement probe design and calibrarions.

- Test GUI with C#.

Key words: BLE , I2C , CC2540 , FDC1004 , Special probe design

ENELSAN | Leak Test Detector

Test device for critical leaking products such as furnaces and tubes in production lines. By the air pressure method. Basic logic; To measure the difference between the impermeable reference object and the pressure drop of the object tested for leaks. The project was developed with my 2 teammates. [LINK]

Key activities:

- Firmware developed in C++.

- Pcb design.

- Design and communication with Nextion smart screen interface.

- Communication with industrial pressure measurement sensors.

Key words: 4-20 Ma ,ADC , Altium , Pcb design , SPI , TTL , UART , Smart Screen

ENELSAN | Electromagnetic Flowmeter

Electromagnetic flow meter. The project was developed with my 6 teammates. [LINK]

Key activities:

- Firmware developed in C and hardware design.

- Calibration algorithms.

Key words: 4-20 Ma , ADC , STM32 , Altium , Pcb design

INTERNS

Kocaeli Universty. Electronics and C Lab. — *Part Time Student Assistant*

AUG 2016 - JUL 2017

Activities

- Laboratory supervision and support to research assistants.

- Algorithm designs and applications.

Used Tools & Technologies

C , Electronic design , Altium

TÜPRAŞ — *Intern*

MAY 2016 - JUL 2016

Activities

- Institutional experience (Turkey's largest company)

- Industrial measuring instruments field experiences.

Used Tools & Technologies

DCS systems , PLC

Kocaeli Üniversity Embeded Systems Lab. KULE — *Intern*

JULY 2015 - AUG 2015

Activities

- Embedded devices and Phone comminications with BLE.

- Phone applications design.

Used Tools & Technologies

Java , Android Studio

EDUCATION

Kocaeli University — *BS(Electronics and Communication Engineering)*

2013 - 2018 - 1 year for English preparation

- **Graduation thesis:** Autonomous underwater vehicle robot arm project.
- LuckyFin Underwater Robot Team Member.
- KOU Robotic Club Team Director
- IEEE technical coordinator

COURSES

- OOP - C++ / JAVA - ELGİNKAN - 150 hour
- C programming - Necati Engin - 200 hour
- C++ programming - Necati Engin - 200 hour
- Advanced C++ programming - Necati Engin - 200 hour
- Embedded Linux - Kaan Arslan - 320 hour - **Continues**
- American Life C1 English.

Books that have been read:

- Effective modern C++ - Scott Meyers
- Design Patterns for Embedded Systems in C - Bruce Powel Douglass
- Design Patterns(C++) - Erich Gamma
- Test Driven Development for Embedded C - James W. Grenning
- Embedded Software Design: A Practical Approach to Architecture, Processes, and Coding Techniques - Jacob Beningo
- AND MORE BOOKS ABOUT : C++ / C

LANGUAGES

English / Fluent

INTERESTS

Runing , Traveling , Boxing , Playing Guitar

REFERENCES

Will be furnished upon request