MOHAMMAD SAADATFAR

Senior Power Electronics Engineer and Embedded Software Developer

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ABOUT ME

With over 14 years of experience in embedded software development and 12 years in electronics circuit design, my expertise encompasses Electronics, Power circuits, Analog circuits, Digital and High-Frequency circuits, Embedded Programming, and PCBA Design. As the former CTO of Mersateb Co., a small medical device manufacturer, I was responsible for both coding and design aspects. Our team successfully launched six innovative medical devices, solidifying our status as a leading producer in dermatology equipment.

EXPERIENCE

Mersateb Co. *Medical Device Manufacturing Company*

Tehran, Iran & Istanbul, Turkiye | 2015 – 2023

CTO, CoFounder | Electronics Engineer

- Actively contributing to coding and design, and successfully launched 6 medical device products such as Electrosurgical Plasma, Fractional Micro Needling Radio Frequency, Vaginal Radio Frequency, Carboxy Therapy, and Termo Fractional Device (Download Catalogs).
- Designed and developed 20+ PCBAs including high frequency, high voltage, and micro controller boards.
- Coded 10+ embedded software firmware in C for devices, quality control, and test boards, using ARM, AVR, and FreeRTOS platforms in compliance with IEC 62304 (Medical device software — Software life cycle processes).
- Achieved ISO 13485, ISO 9001, Low Voltage Device Certification (LVD 2014/35/EU), and Medical CE Certification (MDD 93/42/EEC).

Faradars *E-Learning Platform*

2015

Altium Designer PCBA & OrCad Courses Teacher

- Instructed 9000+ students in 'Printed Circuit Board Assembly (PCBA) Design using Altium Designer.' The course received a 4.3/5 rating based on student reviews.
- Instructed 1300+ students in 'Electrical Circuit Simulation using OrCad,' earning an average rating of 4.8 out of 5 based on student reviews.

Freelancer

2011-2015

Electronics System Engineer and Embedded Developer

- completed 5+ projects, including the development of 3 industrial QC and monitoring systems, a kart lab timing system, and a remotely-operated underwater vehicle.
- Utilized technologies and tools such as Programmable Logic Controllers (PLC), Field Programmable Gate Arrays (FPGA), AVR, and ARM microcontrollers, as well as the LabVIEW development environment.

Power Electronics - University of Tehran

2015

Chief Teacher Assistant

- Lectured in 15+ laboratory sessions (1 per week) and authored course lab materials.
- Directed exam grading team (Final, Midterm, and 4+ quizzes).

PROJECTS

Solatrix™ Fractional Thermo-mechanical Device

2021

Solatrix is a fractional thermo-mechanical device that rejuvenates and removes skin lesions by transferring heat to the skin through a high-temperature titanium tip, stimulating collagen production.

- Designed ∼1x1cm high-temperature (+400°C) titanium tip warmer and cooling system.
- Developed using fast (∼3m/s) DC linear servomotor to improve safety and accuracy, Android embedded HMI, and ARM Cortex-M Processor.

MadamX™ Vaginal RF Device

2020

MadamX uses safe electrodes to emit RF that increase the temperature of the underlying layers and muscles in the vagina, while EMS stimulates the natural neuro-muscular mechanisms in the pelvic floor.

- Pioneered featuring simultaneous 4MHz radio frequency and electrical muscle stimulation treatment.

Firebolt™ Plasma Device

2018

The Firebolt plasma device is a high-safety device used for treatments such as Blepharoplasty, skin lesions removal, freckles, and wrinkles using high voltage/frequency plasma.

- Achieved top selling status for plasma device in Iran with 800+ active installations.
- Attained the highest frequency of 250KHz among similar devices using high-frequency, high-voltage (∼5kV) power generator.

Nettle™ Fractional RF Device

2018

Fractional RF technology uses fractional needles to apply the high frequency voltage to stimulate collagen and elastin production in specific skin layers, leading to skin rejuvenation.

- Obtained license for the 1st and only fractional RF device manufactured in Iran and achieved 250+ active installations.
- Realized safe (FMEA) 4MHz, E-class variable load power radio frequency generator.

Hurricane™ Carboxytherapy Device

2017

Hurricane initiates reactions through controlled CO2 injections resulting in vasodilation, increased blood flow and body temperature, oxygenation of the targeted area, increased metabolism and tissue rejuvenation, and decreased cellulitis.

- Validated <15mL injection volume accuracy.

Remotely Operated Underwater Vehicle

2014

- Implemented using Xilinx FPGA, LabVIEW control and monitor panel, and DC Motor.
- Obtained 3rd place in IranOpen RoboCup ROV league 2014.

Latex Condom Inflation Burst Volume and Pressure Testing Equipment

2015

- Implemented precision pressure-volume graph monitor and automatic quality control report generator using LabVIEW software for monitoring panel, Mass flow sensor, and air pressure sensor.

Latex Condom Water Leak Testing Equipment Logger and Monitor System

2015

- Standardized according to ISO 4074:2002 using Delta PLC.

Production Line Product Counter

2014

- Developed using Siemens PLC LOGO! and infrared transceiver with ability to save history and Web panel monitor.

Kart Lap Timing System

2011

- Proposed 2 architecture using Magnetic and Inferred sensors with accuracy of <1mSec and performed using infrared transceiver and AVR microprocessor.

EDUCATION

MSc in Power Electronics and Electrical Machines — 2015 – 2018

University of Tehran

Thesis: Performance Improvement of Reactive Power Sharing in Photovoltaic Islanded Microgrids

BSc in Electrical Engineering — 2011 – 2015

University of Tehran

Specialization: Control
Thesis: Optimizing the Motion of Soft Quadruped Robot Using Genetic Algorithm

SKILLS

Electronics and Power Electronics: Printer Circuit Board (PCB, PCBA) Altium Designer, OrCAD, LabVIEW, PowerSIM, MATLAB, Simulink, DC/DC and AC/DC Convertors, PLC

Embedded Engineering: ARM, Keil, FreeRTOS, FPGA, Linux Kernel Programming, Buildroot

Programming Languages: C, C++, Verilog, C#, SQL, Javascript

Regulation and Standards: Medical Device CE (93/42/EEC), Low Voltage CE (2014/35/EU), ISO 13485, ISO 9001, ISO 14971 (Risk Management), IEC Standards, EMC

Project Management & Analysis: Agile (Scrum), Kanban, FMEA

Other Skills: Fullstack Web Development (ASP.Net, Vue.Js, Astro), Solidworks, Git, Docker, LaTeX

Languages: English, Persian