MOHAMMAD SAADATFAR

**Senior Power Electronics Engineer**

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# ABOUT ME

# With over 12 years of experience in electronic system design and a master's degree in power electronics engineering, I have expertise in high-frequency circuits, power circuits, embedded systems programming (specifically ARM and FPGA), and Altium PCBA design. I served as the CTO of Mersateb Co., a small-sized medical device manufacturer. My role involved hands-on participation in different aspects of product development, particularly in electronics and embedded programming. We successfully launched six products, establishing Mersateb Co. as a top producer in the dermatology device sector.

# EXPERIENCE

## Mersateb Co. *Medical Device Manufacturing Company* Tehran, Iran & Istanbul, Turkiye 2015- 2023

### CTO, Co-Founder | Electronics Engineer and Embedded Developer

* 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.
* 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 & 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

Major: 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

**Mechatronics:** Solidworks, Simualink

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

**Programming Languages:** C, C++, Assembly, 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), Git, Docker, LATEX

**Languages:** English, Persian