MOSTAFA VAFAEI

PH. D. OF ELECTRONIC ENGINEERING

PROFILE INFO

Electrical and Electronics Engineer and Postdoctoral Researcher with 10+ years of research and development experience in sensor systems, MEMS, microfabrication and electronic instrumentation. Experienced in the design, simulation, fabrication and experimental characterization of sensing and analytical devices, with particular expertise in NDIR and chemical gas sensors, MEMS-compatible detectors and miniaturized mass spectrometry.

I have hands-on experience in device/system design, CNC-based fabrication, COMSOL Multiphysics simulation, and experimental development of ionization, mass analysis, and Faraday cup detection components.

ACADEMIC BACKGROUND

Ph. D. Electronic Engineering **2015 - 2020**
Islamic Azad University, West Tehran Branch. Iran.

Simulation, design, and fabrication of a novel Carbon dioxide gas sensor. Proposing a breakthrough chamberless approach in fabrication of an NDIR gas sensor.

M.Sc. Electronic Engineering **2005 -2008**
Iran University of Science & Technology (IUST), Tehran-Iran.

A MATLAB based simulation of lightening and thermal systems of a smart home with fuzzy logic.

B.Sc. Electronic Engineering **2001 -2005**
Islamic Azad University, Bojnourd Branch. Iran.

Simulation of an Arithmetic Logic Unit

EXPERIENCES

POSTDOCTORAL RESEARCHER – RF MEMS, SENSOR SYSTEMS, AND MICROFABRICATION
SABANCI UNIVERSITY, ISTANBUL, TÜRKIYE | 2023 – PRESENT

- RF MEMS devices and monolithic integration for high-frequency systems
- Advanced gas sensing platforms (NDIR and chemo-resistive)
- MEMS-compatible detectors and micro/nano-fabrication techniques
- Miniature mass spectrometry systems, including ionization sources, mass analyzers, and Faraday cup detectors
- Device design, CNC-based fabrication, and COMSOL Multiphysics simulation
- Electronic hardware, PCB design, embedded C/C++, and analogue/mixed-signal circuit development

RESEARCHER AT SENSOR LAB, ISLAMIC AZAD UNIVERSITY, WEST TEHRAN BRANCH. IRAN. 2015- 2022.

- Gas sensing and device design, including optical and chemical sensing approaches
- Sensor Systems and Experimental Platforms
- Data Analysis and Intelligent Sensing

EXPERTISE

Programming and Data Analysis

- Python, MATLAB, embedded C/C++, PCB design, analogue and mixed-signal circuits, signal processing, data analysis, machine learning for sensor systems

Sensor Technologies and Device Design

- NDIR and chemical gas sensors, MEMS-compatible detectors, sensor systems and device design

Microfabrication and Simulation

- MEMS/microfabrication, COMSOL Multiphysics, CNC-based fabrication, device prototyping

Teaching and Mentoring

- Undergraduate teaching, student supervision, and research mentoring

RESEARCH INTERESTS

- Sensor systems and intelligent sensing technologies
- MEMS and micro/nano-fabrication for electronic and sensing devices
- Optical and chemical gas sensing
- Miniaturized mass spectrometry and ion detection
- RF MEMS and high-frequency systems
- Signal processing and machine learning for sensor data
- Electronic hardware, embedded systems, and sensor interfaces