

## CV: Alireza Shirani

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Medical Image and Signal Processing Research Center (MISP Center), Isfahan Medical University, Isfahan, Iran, 81745319

Citizenship: IRAN

### Summary:

- ✓ Creative engineer in electronics and programming such as FPGAs, Video Processor (TMS320DM642), CPLD, ARM, AVR, 8051
- ✓ 4+ Years of professional experiences in designing digital and analog electronic boards
- ✓ Having done over 20 different projects from start to end in medical devices and electronics industry
- ✓ Having a solid background and experience in application developing for Android platforms

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### RESEARCH INTERESTS

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- Embedded systems development
- Machine learning
- Chip design
- Implement algorithm on FPGA & DSP Board
- Robotics & digital controlled devices
- Hardware/software co-design
- Image processing
- ASIC design
- SoC Design
- Signal processing
- VLSI design

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### EDUCATION

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Shiraz University

Shiraz, Iran

M.Sc. in Electrical Engineering (Electronics)

Sep 2007 - Feb 2011

Title Thesis: *“Implementation of digital zoom with high quality based on TMS320DM642 Video processor hardware”*

Thesis Supervisor: Associate Prof. Mehran Yazdi, Associate Prof. Mohammad Hossein Sheikhi

Azad University, Najafabad Branch (IAUN)

Isfahan, Iran

B.Sc. in Electrical Engineering (Electronics)

Sep 2002 - Jul 2007

Title Thesis: *“Design of FPGA board based on SPARTAN 3 in order to use in computer architecture laboratory”*

Thesis Supervisor: Homayoun Mahdavi Nasab

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### Conference Publications

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- “Real time implementation of bilinear interpolation algorithm for videos based using DSP processor”, the 6th Iranian machine vision & image processing conference (Persian conference), Alireza Shirani, Mehran Yazdi, Mohammad Hossein Sheikhi

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### Teaching and Academic Experience

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- ✓ Lecturer at Islamic Azad University, khomeinishahr branch, Isfahan, Iran (Mar 2010- Dec. 2013)
  - Microprocessors, Logic circuit, Electric circuits 1, 2, Electronics 1,2, Application of electronics, Application of computer in electronics, Introduction of electrical engineering, Electronics 1 lab, Logic circuit lab, Measurement & circuit 1 lab
- ✓ Lecturer at Islamic Azad University, Meymeh branch, Isfahan, Iran (Dec. 2011- May 2012)
  - Electric Circuits 1, Electronics 1 Lab, English for electrical engineering

- ✓ Lecturer at Islamic Azad University, Naein branch, Isfahan, Iran (Jan. 2012 - May. 2012)
  - Microprocessors, Microprocessors Lab
- ✓ Safahan institute, Isfahan, Iran(Mar 2011- May 2011)
  - Television system

## Work Experience

### Research engineer at Medical Image & Signal Processing Center (MISP), Isfahan University Medical of science Dec 2012 - Present

#### These Projects have been done at MISP center

My role: Own the idea, Design the schematic and PCB, Program the micro controller, Test the prototypes, Finalize the design and produce the product

- 1- Design and build DICOMIZER hardware in order to convert ultrasound video stream (General Electric Logic 200 series ultrasound) to standard medical images DICOM format. (Jan. 2013 -Feb.2014)
- 2- Developing software in order to aid & Rehabilitation Patients with language disorders. (Mar. 2014 - Jan.2015)
- 3- Design software in order to create endoscopic kymography images from video laryngoscopy based on OpenCV & C++.(Feb.2015 - Dec. 2016)
- 4- Design & build AVL (Automatic Vehicle Location) system for ambulance. (Dec. 2015 -Nov. 2016)

#### Project newly started at MISP Center:

- ✓ Start to implement Feldkamp davis algorithm (Algorithm in Computerized Tomography reconstruction) on ZYNQ FPGA Board (ZC702).
- ✓ Start to develop application based on Android operating System in order to Detect Vitiligo Improvement for Dermatologist

## Selected Industrial Projects

My role: Own the Idea, Design the schematic and PCB, Program the micro controller, Test the prototypes, finalize the design, and produce the product

- 1- Design and build Fetal Doppler Monitor Ultrasound(with 5000\$ Grant )

Specifications:

- ✓ Equipped with 3 Probe
  - i. FHR Probe: measuring Fetal Heart Rate
  - ii. TOCO Probe: measuring uterine contractions during pregnancy
  - iii. Pulse Oximetry Probe: monitoring a person's oxygen saturation (SO<sub>2</sub>)
- ✓ Able to print sketch based on thermal printer
- ✓ back up battery
- ✓ work with city power & backup battery
- ✓ ARM LPC17788 as main processor with 7 inch TFT color LCD

- 2- Design and build special VGA video card in order to display Gold & Currency in exchange(with 3000\$ Grant )

Specifications:

- ✓ Based on LPC1768 ARM microprocessor & XC95288 CPLD
- ✓ Able to display English & Farsi font characters on monitor via VGA port, resolution 800\*600
- ✓ Get data from GPRS(SIM908 Module)

- 3- Design and build electronic board for controlling motors via computer in oxygen maker factory.
- 4- Design and build smart lighting system in stone store with capability control via radio frequency remote control and cellphone android application.
- 5- Design and build display & command board for washing machine(SNOWA Company)
- 6- Design and build intelligent power distribution system

Specifications:

- ✓ Able to measure current consumption of 10 electrical devices up to 15A
- ✓ Connect via RS232 to PC

- ✓ Draw power consumption curve on C#
- ✓ Automatically turn off electrical equipment

## Technical Skills

### Image & Signal Processing:

#### Hardware:

- TMS320DM642 EVM

#### Software:

- Code Composer Studio( Texas Instruments DSP )
- OpenCV
- Emgucv
- MATLAB

### Digital Electronic experience by myself at home:

- Cubie board
- Raspberry Pi

### Digital electronics and microprocessor:

#### Hardware:

- FPGA(SPARTAN3series),XC3s400
- Cortex M3,ARM microprocessor (LPC1768 -LPC1788)

#### Software:

- ISE
- Keil uvision

### Electronics Software:

- Orcad
- Altium Designer(PCB routing)
- Pspice
- Bascom-AVR

### Mechanics and Robotics:

#### Projects:

- Design & Build arm robot
- Autodesk inventor

### Computer Programming Language:

• C/ C++,C#	• Android Programming based on Eclipse
• QT	• VHDL