

Pouya Nosratkhah

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EDUCATION

MSc. Honors Electronic Engineering With Nanoelectronics Engineering Specialization Tehran | 2020

UNIVERSITY OF SCIENCE AND TECHNOLOGY

RA: Member of Nanoptronics research center

Master's Thesis: "Single photon emitter based on compound quantum dots for the Quantum computation applications", under the supervision of Prof. Shahram MohammadNezhad, University of science and technology, Tehran, Iran

GPA: 18.22/20 (Rank 3)

BSc. Honors Electrical Engineering With Electronic Engineering Specialization Tabriz | 2016

UNIVERSITY OF TABRIZ

Bachelor's Thesis: "ECG signal processing and detecting QRS points with high accuracy", under the supervision of Prof. Javad Frounchi, Tabriz university, Tabriz, Iran

GPA: 17.40/20 (Rank 15)

WORK EXPERIENCE

BEHTAB CO. | RESEARCH ASSISTANT (RA) Tabriz | 2020- 2021

- Developing a 8GHz time domain radar with 2nS pulse width to accurately measure the distance between the antenna and object.
- Research on the system which measures the water flow in the rivers without any direct contact with the water via ultrasonic and electromagnetic radars.

SABA PALAYE CO. | INTEGRATED PROGRAMMER AND ELECTRONIC BOARD DESIGNER Tabriz | 2017 – 2020

- Employee of R&D section.
 - Designed and produced different control circuits based on company needs.
 - Repairing Electronic Boards and Electronic Facilities of company like Oscilloscopes and Electrostatic filter's control boards.
 - Design of water cooling heat sink for a specific electronic board via copper pipes embedded in a cast aluminum.
 - Study on principle of HEPA and Electrostatic filters.
 - Participated in Mechanical design of patient bed lift via solid works and auto-cad software.
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RESEARCH

THE EFFECT OF ION RADIATION ON SINGLE-PHOTON EMISSION FROM PBS QUANTUM DOTS 

2022

Under review paper by Pouya Nosratkhah and supervision of Dr. Hossein Arab and Prof. Shahram Mohammadnezhad

A REVIEW ON THE LATEST PROGRESS IN ROOM TEMPERATURE SINGLE PHOTON EMITTERS  2022

Under review paper by Pouya Nosratkhah and supervision of Dr. Hossein Arab and Prof. Shahram Mohammadnezhad

DESIGN, ANALYSIS, AND SIMULATION OF HYBRID QUANTUM DOTS FOR SINGLE PHOTON EMITTER APPLICATIONS  2022

Master's thesis by Pouya Nosratkhah and supervision of Dr. Hossein Arab and Prof. Shahram Mohammadnezhad
Development of PbS (Lead sulfide) quantum dots with specific defects, capable of emitting anti-bunched photons in telecom wavelength regions. This device is helpful in generating quantum particles (in this case, photons) as an initiation for the quantum computation and communication process.

A COMPREHENSIVE QRS DETECTION METHOD BASED ON EXCLUSIVE MOTHER WAVELET AND ARTIFICIAL NEURAL NETWORK  2021

Article by Pouya Nosratkhah and Javad Frounchi

Published in the Biomedical engineering: applications, basis, communication journal.

A state of the art method to detect heartbeats in an ECG signal to obtain life-saving information with an ultra-high accuracy of 99.81%(Sensitivity).algorithm uses an exclusive mother wavelet and CNN neural network to gain the expected accuracy.

PROJECTS

PRESSURE SENSOR WITH QUARTZ CRYSTAL [↗](#)

DDS, ARM, PASSIVE FILTERS, ORCAD,ALTIUM

The resonance frequency of quartz crystals would change at different pressures. So an electronic circuit based on STM32 microprocessor is built, which can synthesize and shift frequency from 5Mhz to 50 Mhz, capable of covering five harmonics of 10 Mhz quartz crystal. Eventually, by monitoring the amount of power dissipation concerning the frequency applied to the exposed crystal, the processor can calculate the amount of pressure and temperature applied to the crystal.

NURSE CALLING SYSTEM [↗](#)

C, ARM, TOUCHPAD, NRF24L01 WIRELESS INTERFACE, KEIL IDE, ALTIUM

Designed and produced a nurse call system that allows patients to call or contact their nurse's station quickly. The system consists of two transceiver parts, the central station located in the nurse station and sub-stations adjacent to the patients. 127 main stations can work near each other without collisions, and each central station can cover up to 16 substations. The system works in the 2.4 - 2.52 GHz, and a 100 Mhz bandwidth will be dedicated to each central station. In order to improve reliability, the system supports the CSMA-CD standard.

TRAILER LEVELER [↗](#)

C, ARM, GYROSCOPE, KALMAN FILTER, KEIL IDE, ALTIUM, PID CONTROLLER, EEPROM

Designed and produced an industrial board that can be installed on the trailers to level its axle concerning the X and Y-axis. MPU will provide the information about the axle status, and the ARM microprocessor will control the corresponding relays to switch on and off each jack until the desired situation acquire. The designed board also has an EEPROM to store the system's calibration information.

INSTANT FUEL CONSUMPTION METER [↗](#)

PYTHON, CAN BUS. , BLUETOOTH INTERFACE

Some old cars may not have any options to illustrate Instant Fuel Consumption, so a system produced that connects to the car's OBD port and reads the necessary data from the car's sensors via CAN bus, and sends back acquired information via Bluetooth to the developed software, where the fuel consumption will be calculated.

INTEGRATED CIRCUIT FOR FLAME SENSOR AMPLIFIER [↗](#)

CADENCE IC DESIGN, 90NM CMOS, CMFB

Design and Simulation of a 90 nm CMOS integrated circuit capable of amplifying the current signal of 1fA to 1mA via differential circuits and Cascade active bar. The circuit can eliminate the surrounding noise with differential amplifying, and a CMFB circuit with feedback upgrades the operating temperature of the circuits to the range of -200C to +200 C.

FREQUENCY SYNTHESIZER [↗](#)

C, ARM, AD9833, ALTIUM

Programmed STM32 ARM Microprocessor to work with AD9833 Waveform generator IC. The obtained frequency range is 10Hz to 12.5MHz with 1Hz accuracy and three main signal shapes. Deployed Altium designer tool to design the PCB.

CRYPTOCURRENCY MINER'S FACILITATOR SYSTEM [↗](#)

RASPBERRY-PI, LINUX, AVR, SIM800

- **Wireless network:** Design, Simulation, and Fabrication of an electronic board capable of connecting to the GPRS network via sim800 and transferring internet connection to a raspberry pi board with a UART connection. Eventually, the Raspberry pi board will connect to a Miner device via LAN cable and transfer the wireless internet to the desired device.
- **Fan simulator:** Miner devices take feedback from fans to obtain their rotation speed. Hence with uninstalling the fans, the operation of the device will terminate. For some specific reasons, an electronic board was produced to simulate the three and 5-wire fans' feedback signal so the fans can be removed.
- **Farm manager:** An electronic board that is capable of monitoring and controlling up to 32 Miners simultaneously.

CAMERA CRANE [↗](#)

C, AVR, SOLID WORKS, AUTOCAD, DC MOTORS

A crane with an active head was designed and assembled to control the camera rotation on three axes with a controller board. The operator can control the camera's filming direction via joy-sticks on the main board.

DETECTION AND ELIMINATION OF HOWLING SOUND [↗](#)

MATLAB, SIGNAL PROCESSING

The developed code takes the voice from the microphone as input and continuously monitors the absence of howling sound caused by positive feedback between the microphone and speakers, which makes the speaker's sound volume saturated. If positive feedback establishes, before the audience can hear any howling sound, the Program will detect the

frequency and play the same frequency with a phase shift to eliminate the howling sound.

EDGE DETECTION IN GRAYSCALE IMAGES

VHDL, FPGA, ISE, SOBEL

VHDL program will read the image data and store them respectively in a designed RAM inside FPGA and eventually perform the SOBEL algorithm for the input data to obtain the edges of the corresponding image.

IMAGE CLASSIFICATION PROJECT USING CNN MODEL

PYTHON, TENSORFLOW, ARTIFICIAL

INTELLIGENCE, BIG DATA

Performed exploratory data analysis on the CIFAR-10 dataset with 60,000 images. Trained a CNN model with 50,000 train images and used it to predict 10,000 remaining test images.

HONNORS

- Recipient of Honory Admission for Graduate Studies from the university of science and technology (IUST).
- Ranked as top 10% undergraduate student in the faculty of electrical and computer Engineering of the University of Tabriz.
- Member of Nanoptronics Laboratory, Faculty of Electrical Engineering, University of Science and Technology, Tehran, Iran.
- Member of Microelectronic and Micro-Sensor Laboratory, Faculty of Electrical and Computer Engineering, University of Tabriz, Tabriz,
- Awarded HSE certificate
- Among top 2% in the Iranian University Entrance Examination for Undergraduate Studies.
- Graduated from NODET(National Organization for Development of Exceptional Talents) High school and elementary school.

LANGUAGE SKILLS

English: fluent **Turkish:** native **Persian:** native **Arabic:** basic

SKILLS

Languages: C, Python, Matlab

Softwares: Gaussian, QE, COMSOL, Matlab, Cadence, Altium, ISE, Keil, OrCad, SolidWorks, AutoCad, \LaTeX

Technology: ARM, AVR, Arduino, 1 layer PCB fabrication via lithography and ACID etching with 0.4 mm resolution, SMD devices and microprocessor welding, Arc welding of metals

Hobbies and interests: Playing Piano, Tennis, Wild Life photographer

REFERENCES

Dr Javad Frunchi jfrounchi@tabrizu.ac.ir

Dr Shahram Mohammad nezhad Shahramm@iust.ac.ir

Dr Mohammad azim karami Karami@iust.ac.ir

Dr Ziaddin Daie Koozehkanani zdaie@tabrizu.ac.ir