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Ahmad Salmanogli Khiavi

Personal Information

First Name: Ahmad
Last Name: Salmanogli khiavi
Birth Date: March 21th 1982
Born in: Meshkin-IRAN
Hometown: Meshkin-IRAN

Contact Information

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Mailing Address: Ardebil, IRAN
Turkey Address: Ankara, Turkey.

Education

B. Sc. (10.09.2001–18.06.2005) Electrical Engineering, Sahand University of Technology, Tabriz, IRAN
Thesis:
“The controlling of asynchrony motors' speed by 8051 microcontrollers and PLC7”– under the supervision of Dr. M. Banaei

M. Sc. (10.09.2005–13.05.2007) Electrical Engineering, Tabriz University, Tabriz, IRAN
Thesis:
“The design and Simulation of Er-Silicon nanocrystal doped fiber optical amplifiers” - under the supervision of Dr. A. Rostami

PHD (18.09.2017–01.06.2021) Electrical Engineering, Hacettepe University, Ankara, Turkey
Thesis:
“Design of a Quantum Radar System with Sustainable Entanglement”– under the supervision of Dr. D. GOKCEN

Major Areas of Interest

- Quantum Circuit and Quantum-RF Circuit Design (Qubit design, cryogenic LNA for qubit readout and controlling)
- Quantum Sensor and Quantum Radar
- Plasmonic & Quantum Plasmonic
- RF circuits design and implementation (PA, LNA, Mixer, LO, and Filters)
- Design of Radar receiver and transmitter
- Plasmonic based Nanobiosensor and Nanosensor
- Plasmonic-photonic based imaging sensors
- Portable Bio-chip for early and easily detection of breast cancer cells
- Raman and Fluorescence Signals Enhancing by plasmonic and Nonplasmonic
- Code Programming in MATLAB and Python (Spyder and Jupyter Lab)
- Modeling and Simulation with: COMSOL, ADS (Advanced Design System), Cadence, and Proteus

Academic Honors and Awards

- Ranked 282th among about 30,000 participants in the national university entrance exam to apply for M.Sc. degree in Electronic Engineering program.
- Ranked 317th among about 200,000 participants in the nationwide university entrance exam for B.Sc. degree, “Konkoo-e Sarasari”.
- Third Place among the students of Electrical Engineering (2001-2005, Sahand University of Technology, Tabriz, IRAN), Total GPA: 16.53/20.00
- Second Place among the M.Sc. students of Electrical Engineering (2005-2007, Optical Electrical engineering, Faculty of Tabriz University, Tabriz, IRAN), Total GPA: 18.22/20.00
- The award of the best RF/MW circuit engineer at the Iranian Electronic Institute in 2010

Research and Computer Skills

- Good experience with programming languages and familiar with the following programming environments:
 - MATLAB
 - COMSOL Multiphasic
 - ADS (advanced design system) and IC-CAP
 - Cadence (Virtuoso)
 - Proteus
 - Python (QisKit and Qutip)
 - C++
 - MAPLE
 - C-8051
 - PLC (S7)

Projects (Research, Applications, and Implementations)

- Design and modeling of Sustainable Entanglement Quantum Radar system; self-study
- Cryogenic LNA for quantum computing applications (Qubits readout); self-study
- Microwave entangled photon generation with Optoelectronic system, qubits, and electro-opto-mechanical converter; self-study
- RF circuits design (schematic and layout) and implementation of LNA, PA, LO, mixer, and RF filters for L-,S-,C-, and X-band; **RF circuits design with ADS, and RFICs design with Cadence Virtuoso**
 - LNA for L-band receiver (0.18 um CMOS; BW: 1.1-2.1 GHz, Gain: 18 dB, NF~ 1.1 dB, RL < -12 dB)
 - LNA for X-band receiver (0.18 um CMOS; BW: 8-12 GHz, Gain: 20 dB, NF~ 2.6 dB, RL < -10 dB)
 - LNA for C-band receiver (40 nm CMOS; BW: 4.5-5.8 GHz, Gain: 38 dB, NF~ 1.1 dB, RL < -10 dB)
 - LNA for S-band receiver (65 nm CMOS; BW: 2.1-2.9 GHz, Gain: 25 dB, NF~ 1.8 dB, RL < -10 dB)
 - PA for S-band transmitter (250 W, RL < -12 dB, PAE > 68%)
 - PA for C-band transmitter (200 W, RL < -10 dB, PAE for PA > 59%)
 - Mixer and LO (65 nm CMOS, 45 nm CMOS, and 180 nm CMOS); for design of radar transmitter and receiver operating in L, S, C, and X bands
- Design and modeling of Plasmonic based nanobiosensor for early and easy detection of the breast cancer
- Theoretical modeling of Raman and Fluorescence signals enhancing by portable nanosensor
- Solution based Raman signal enhancing by core/shell nanoparticles

- Manipulation of optical force by plasmonic-photonic interaction
- Design and assembling of the tune tracking algorithm for cancer site with nano-bio-sensors (biomedical assays stage)
- Design, Simulation, and Implantation of Tumor Tune Targeting by using of Smart Nano-Sensors Communications
- Lab on a Chip: Cell Separation by Nanoparticle optical force
- Breast Cancer detection portable Bio-chip: Design and Simulation
- Design and simulation of silicon nanocrystal and ER-doped fiber amplifier

Patents and publications and presentations

Patents:

- 1) **Patent 1:** A. Salmanoglu, Portable In-vitro & In-vivo Imaging System in the Low Photon Condition Based on the Plasmonic-Photonic Virtual Mask image processing system, 2016; **IR Patent.**
- 2) **Patent 2:** Design and Optimization of Multi-Amplifier Pasteurization System for Efficient Product Processing (Conceptual design), ready to apply, 2023.
- 3) **Patent 3:** A small hand-held satellite for quantum communications on a global scale (Conceptual design); ready to apply, 2023.

Articles:

- 1) Ahmad Salmanoglu, V. S. Sirat, Design of ultra-low noise amplifier for quantum applications (QLNA), **Quantum Information Processing**, 2024.
- 2) Ahmad Salmanoglu, V. S. Sirat, Engineering Qubit Coupling to Reservoir Mode: Optimizing Circuitry to Extend Coherence Time, **Chinese Journal of Physics**, 2024.
- 3) Ahmad Salmanoglu, et al, Quantum Correlation of Microwave Two-mode Squeezed State Generated by Nonlinearity of InP HEMT, **Scientific Reports**, 2023.
- 4) Ahmad Salmanoglu, et al, Enhancing Quantum Correlation at Zero-IF Band by Confining the Thermally Excited Photons: InP HEMT Circuitry Effect, **Optical and Quantum Electronics**, 2023.
- 5) Ahmad Salmanoglu, et al, Quantum dot transition rate modifying by coupling to lattice plasmon, **Optical and Quantum Electronics**, 2023.
- 6) Ahmad Salmanoglu, et al, Entangled State Engineering in the 4-Coupled Qubits System, **Physics Letters A**, 128925, 2023.
- 7) Ahmad Salmanoglu, Squeezed states generation using cryogenic InP HEMT nonlinearity, **Journal of Semiconductors**, 44, 1-9, 2023.
- 8) Ahmad Salmanoglu, H. Selcuk Geçim, Accurate method to calculate noise figure in a low noise amplifier: Quantum theory analysis, **Microelectronics Journal**, 128, 105532-42, 2022.
- 9) Ahmad Salmanoglu, Entanglement Generation using Transistor Nonlinearity in Low Noise Amplifier, **Quantum Sci. Technol.** 7, 045026, 2022.
- 10) A Salmanoglu, D Gokcen, Design of Quantum Sensor to Duplicate European Robins Navigational System, **Sensors and Actuators A: Physical**, 112636, 2021.
- 11) Ahmad Salmanoglu, Dincer Gokcen, Entanglement Sustainability Improvement using Optoelectronic Converter in Quantum Radar, **IEEE Sensor Journal**, 2021.
- 12) Ahmad Salmanoglu, Dincer Gokcen, H. Selcuk Geçim, Entanglement Sustainability in Quantum Radar, **IEEE Journal of selected Quantum Topics in Electronics**, 26 (6),

- 1-11, 2020.
- 13) Ahmad Salmanogli, Dincer Gokcen, Analysis of Quantum Radar Cross-Section by Canonical Quantization Method (Full Quantum Theory), **IEEE Access** 8, 205487-205494.
 - 14) Ahmad Salmanogli, Hüseyin Selçuk Geçim, Optical and Microcavity Modes Entanglement by means of Developed Opto-Mechanical System, **IEEE Journal of selected Quantum Topics in Electronics**, 2020.
 - 15) Ahmad Salmanogli, Modification of the Plasmonic Nanoparticle Life-time by the Coupled Quantum Dots, **Phys. Rev. A**, 2019.
 - 16) Ahmad Salmanogli, Dincer Gokcen, Identification of Circulating Tumor Cells Using Plasmonic Resonance Effect: Lab-on-a-Chip Analysis and Modelling, **J. Nanosci. Nanotechnol.** 20, 1341–1350, 2020.
 - 17) Ahmad Salmanogli, Dincer Gokcen, H. Selçuk Geçim, Optical and Microcavity Modes Entanglement by means of Opto-Electronics System, **PHYSICAL REVIEW APPLIED** 11, 024075 (2019).
 - 18) A Salmanogli, D Gokcen, HS Gecim, Plasmonic Effect on Quantum Dot Photodetector Responsivity, **IEEE sensors Journal**, 2019.
 - 19) A. Salmanogli, Entangled two-photon interference, **Optik**, 179, 909-913, 2019.
 - 20) A. Salmanogli, Raman mode non-classicality through entangled photon coupling to plasmonic modes, **Journal of the Optical Society of America B**, 35, 2467-2477, 2018.
 - 21) A. SalmanOgli, H. S. Geçim, Quantum Eye: Lattice Plasmon effect on Photon detection, **Annals Physics**, 2018.
 - 22) Ahmad Salmanogli, H. Selçuk Geçim, Plasmonic System as a Compound Eye: Image Point-spread Function Enhancing by Entanglement, **IEEE sensors Journal**, 2018.
 - 23) A.Salmanogli, H. S. Geçim, Array of Nanoparticles Coupling with Quantum-dot: Lattice Plasmon Quantum Features, **Physica E: Low-dimensional Systems and Nanostructures** 100 (2018) 54-62.
 - 24) A. SalmanOgli, Raman Modes Non-classicality through Entangled Photons Coupling to Plasmonic Modes, **arXiv:1803.04760 [quant-ph]**, 2018.
 - 25) A. SalmanOgli, K. Salimi, Lattice plasmon effect on imaging resolution: Point-spread function enhancing, **Sensors & Actuators: A. Physical**, 2017.
 - 26) A. SalmanOgli, B. Nasser, E. Piskin, Highly Field Enhancement by Plasmonic Field Engineering in Random Distribution of Au-Au Nanoparticles as SERS Structure, **Journal of Luminescence**, 2017.
 - 27) A. Salmanogli, Quantum-Plasmonic Interaction Analyzing with Full-Quantum-Theory (Core/shells NPs Plasmon-Plasmon Interaction effect on QDs), **physical review A**, 2016.
 - 28) A. SalmanOgli, B. Nasser, E. Piskin, Plasmon-Plasmon Interaction effect on Reproducible Surface-Enhanced Raman Scattering for Dye Molecule Detection, **Sensors & Actuators: A. Physical**, 2017.
 - 29) A. SalmanOgli, K. Salimi, Sensitive Plasmonic-Photonic Nanosensor as a Morphologic Mask, **Optical Materials**, 2017.
 - 30) A. SalmanOgli, B. Nasser, M. Yazdani, E. Piskin, Plasmon-Plasmon Interaction Effect on Effective Medium Electrical Conductivity (an Effective agent for Photothermal Therapy), **Current Applied Physics**, 10.1016/j.cap.2016.08.021, 2016.
 - 31) E. Sanattalab, A. SalmanOgli, E. Piskin, Analysis and modeling of localized heat generation by tumor-targeted nanoparticles (Monte Carlo methods), **J. Nanophoton.** 10(2), 026029 (2016).
 - 32) O. E. Haberal, A. SalmanOgli, B. Nasser, Low Noise Patch-Clamp Current Amplification by Nanoparticles Plasmonic-Photonic Coupling (Analysis and

- Modeling), **IET Nanobiotechnology**, 2016.
- 33) A. SalmanOgli, F. Farhadnia, E. Piskin, Separation by Nanoparticles Plasmonic Resonance with Low Stress in Microfluidics Channel (Analytical and Design), **IET Nanobiotechnolgy**, 2016.
 - 34) A. Salmanogli, A. Rostami, M. franoush, M. Dolatyari, Gh. Rostami, E. Piskin, Design of a portable nanosensor for easy breast tomography, **RSC Adv.**, 2015,**5**, 19002-19013.
 - 35) A. Salmanogli, A. Rostami, M. franoush, M. Dolatyari, Gh. Rostami, Enhancement of tumor smart-targeting efficiency based on optical communication between signaling and receiving nanoparticles (modeling and analysis), **RSC Adv.**,2014,**4**, 30984–30992.
 - 36) A. Salmanogli, A. Rostami, S. behzadi, Simulation of Optical Signaling among Nano-Bio-Sensors: Enhancing of Bio-Imaging Contrast, **IEEE Transactions on NanoBioscience**, DOI 10.1109/TNB.2014.2311834, 2014.
 - 37) A. Salmanogli, A. Rostami, Investigation of electronic and optical properties of (CdSe/ZnS/CdSe/ZnS) quantum dot-quantum well heteronanocrystal, **J Nanopart Res.**, vol. 13, pp. 1197-1205, 2010.
 - 38) A. SalmanOgli, Nanobio applications of quantum dots in cancer: imaging, sensing, and targeting,”**Cancer Nano**, vol. 2, pp. 1-19, 2011.
 - 39) H. Absalan, A. Salmanogli, R. Rostami, S. Maleki, Design and Simulation of Fluorescence Resonance Energy Transfer between Modified Quantum Dot (Core/Defect/Shell) Heteronanocrystal and Dye-Molecule,”, **Advanced Science, Engineering and Medicine**, vol. 4, pp. 1–7, 2012.
 - 40) H. Absalan, A. Salmanogli, R. Rostami, A. Maghoul, Simulation and investigation of quantum dot effects as internal heat-generator source in breast tumor site,”**Journal of Thermal Biology**, vol. 37, pp. 490–495, 2012.
 - 41) A. Salmanogli, A. Rostami, Modeling and Improvement of Breast Cancer Site Temperature Profile by Implantation of Onion-Like Quantum-Dot Quantum-Well Heteronanocrystal in Tumor Site, IEEE transaction on Nanotechnology, **IEEE transaction on Nanotechnology**, 11,1183-1191, 2012.
 - 42) A. Salmanogli, A. Rostami, Design and Simulation of Nano-Bio Sensors for Dye Molecules Targeting: to Enhance Targeting Efficiency (smart targeting), **IEEE transaction on NanoBioscience**, 2012., 12, 21-28.
 - 43) A. Salmanogli, A. Rostami, M. Abasi, Simulation of Tumor Targeting Enhancement by Amplifying of Targeted Nano-Biosensors Radiation Intensity, **IEEE transaction on Biomedical engineering**,60, 1328-1335, 2012.
 - 44) A. Salmanogli, A. Rostami, Design and Simulation of Perturbed Onion-Like Quantum-dot-Quantum-well (CdSe/ZnS/CdSe/ZnS) and its Influenceon Fluorescence Resonance Energy Transfer Mechanism, **IEA Nanobiotechnology**, 2013, DOI:10.1049/iet-nbt.2011.0069.
 - 45) A. Salmanogli, A. Rostami, Investigation of Surface Plasmon Resonance in Multi-layered Onion-Like Heteronanocrystal Structures, **IEEE transaction on Nanotechnology**, 12, 831-839, 2013.
 - 46) A. Salmanogli, A. Rostami, Chromatic dispersion behavior of Si-NC–Er doped optical fiber, **Optics Communications** 281 (2008) 4530–4535
 - 47) A. Rostami, A. Salmanogli, Investigation of light amplification in Si_NanocrystalEr doped fiber amplifier,” **Progress In Electromagnetic Research B**, vol. 9, pp. 27-51, 2008.
 - 48) A. Salmanogli, A. Rostami, Study of Effects of inhomogeneous distribution of cooperative up-conversion coefficient on the optical amplification process in the Si_Nc and Er doped optical fiber, **Progress in Electromagnetic Research C**, 2008.
 - 49) M. Meydanchizade, A. SalmanOgli, The Study of Effects of Inhomogeneous Distribution of Dopants in the Si-Nc-Er doped Optical Amplifier, **Optik**, 123 (2012) 1140– 1145.

- 50) A. Salmanoglu, A. Rostami, Plasmon Modes Hybridization Influence on Nano-Bio-Sensors Specification, **IEEE transaction on Nanotechnology**, 12, 858-866, 2013.
- 51) A. Salmanoglu, A. Rostami, Simulation of Optical Signaling among Nano-Bio-Sensors: Enhancing of Bio-Imaging Contrast, **IEEE transaction on Nanotechnology**, DOI: 10.1109/TNB.2014.2311834, 2014.
- 52) H. Absalan, A. Salmanoglu, R. Rostami, A. Maghoul, Simulation of a broadband nanobiosensor based on an onion-like quantum dot – quantum well structure, **Quantum Electronics** 43 (7) 674 – 678 (2013).
- 53) A. Salmanoglu, R. Rostami, Engineering of perturbation effects in Onion-Like Heteronanocrystal Quantum dot-quantum well, **Optics Communications**, 306, 2013, 106–112.
- 54) A. Salmanoglu, A. Rostami, Investigation of potential profile effects in quantum dot and onion-like quantum dot-quantum well on optical properties, **Optics Communications** 318 (2014) 26–30.

Conference papers:

- 1) A. Salmanoglu et al, Photodetector Engineering with Plasmonic Properties, **International Journal of Electronics and Communication Engineering** 15 (2), 94-98, 2021.
- 2) A. Salmanoglu et al, Biomedical Device for Early Breast Cancer Detection: Device Performance Improving by Plasmonic-Photonic Mask. **BIOIMAGING**, 161-166, 2019.
- 3) A. Salmanoglu et al, Simulation of Nd: YAG Laser, **Lasers & Electro Optics & the Pacific Rim Conference on Lasers and Electro-Optics**, 2009. CLEO/PACIFIC RIM '09. Conference.
- 4) A. Salmanoglu et al, Design and Modeling of Very Narrow Band-pass Radio Frequency Filter for Optical Pressure Sensor, **2021 13th International Conference on Electrical and Electronics Engineering**, 2021.
- 5) A. Salmanoglu et al, Design and Modeling Interdigitated Capacitor-Spiral Inductor Resonator for Optical Pressure Sensor, **2021 13th International Conference on Electrical and Electronics Engineering**, 2021.
- 6) A. Salmanoglu, A. Rostami, Investigation of Si-Nanocrystal-Er doped Optical Fiber Amplifier, **ISOT Conference**, 2007 Switzerland.
- 7) A. Salmanoglu, A. Rostami, Effects of Optical Losses on Characteristics of Silicon Nanocrystal-Er doped Fiber Amplifier, **HUT-ICCE** (Communications and Electronics, ICCE 2008. Second International Conference on).
- 8) A. Salmanoglu, A. Rostami, Effects of optical losses on characteristics of silicon nanocrystal-Er doped fiber amplifier, **2008 Second International Conference on Communications and Electronics**, 383-388, 2008.
- 9) M Mazloun, A Maghoul, A SalmanOgli, Near-Field Intensifying in Multi-shell Nanoparticles (Si/Au/SiO₂), **The 2nd Asian Symposium on Electromagnetics and Photonics Engineering August 28-30, 2013, Tabriz**, Iran 2011.
- 10) N Li, X Meng, J Nie, L Lin, A Salmanoglu, HS Geçim, E Piskin, A QCM Dew Point Sensor With Active Temperature Control Using Thermally Conductive Electrodes, **IEEE**, 2018.

Under review articles:

1. Ahmad Salmanoglu, Entanglement Engineering by Transmon Qubit in a Circuit QED, arXiv preprint arXiv:2109.00316, 2023-2024.
2. Ahmad Salmanoglu, V. S. Sirat, Short Technical Review of Four Different Quantum Systems: Comparative Analysis of Quantum Correlation, Signal-to-Noise Ratio, and Fidelity, arXiv preprint arXiv:2305.01226, 2023-2024.
3. Ahmad Salmanoglu, Amine Bermak, Quantum Parametric Amplification and NonClassical Correlations due to 45 nm nMOS Circuitry Effect, arXiv preprint arXiv:2310.16385. 2023.
4. Ahmad Salmanoglu, Amine Bermak, Design of Fully Integrated 45 nm CMOS System-on-Chip Receiver for Readout of Transmon Qubit, arXiv preprint arXiv:2401.04228, 2024.
5. Ahmad Salmanoglu, Amine Bermak, Transmon Qubit Readout Circuit Leveraging 45 nm CMOS Technology, RFIC2024 conference, 2024.

Working Experience:

- Control Engineer in chemical and petroleum of TABRIZ (for 4 months); **2003**
- Power electronic engineer in Electrical Distribution of TABRIZ center (TAVANIR) (for 5 months); **2004**
- Electronic engineer in electronic institute of IRAN (**2007-2012**)
 - Design and implementation of LNA, PA, Mixer, LO, and RF filters for L-, S-, C-, X-band radar
- Nankavoshgarane ARAZ: RF circuit design (PA, LNA, Filters and radar receiver) (**2012-2015**)
 - Design of cryogenic receiver operating at 77 K
- European project entitled “nanobacteriophageSERS” in Hacettepe University, Turkey, **2015-2017**.
- **Research Assistant** at Cankaya University, Ankara, Turkey, **2018-2021**.
- **Assistant Professor** at Cankaya University, Ankara, Turkey, **2021-2023**.
- **Assistant Professor** at Ankara Yildirim Beyazit University, Ankara, Turkey, **2024-....**

Educational Workshops

- PLC Workshop
- Field Bus Workshop
- Optoelectronic Workshop
- Phase array radar

Language skills

- Azerbaijani and Persian: Native
- Turkish: Good
- English: Advanced

Teaching Experience

Teaching Courses:

- **Analog CMOS Design and Theory** (Cankaya University) 2019-2023; in this course Cadence has been used to design and simulate the CMOS circuits (schematic and layout)
- **RF Circuit theory and design** (Cankaya University) 2019-2023; in this course ADS and COMSOL have been used to design and simulate the RF circuits (schematic and layout)
- **Electronics II and III** (Cankaya University) 2020-2023; in this course ADS has been used to design and simulate the circuits (schematic)
- **Introduction to Electronics** (Cankaya University) 2017-2023
- **Circuit Theory I and II** (Cankaya University) 2019-2023

Teaching Assistantship:

- Electrical Circuit Theory (I and II) (Cankaya University) 2017-2019
- Electronics I and II Labs, (Cankaya University) (Cankaya University) 2017-2019
- Electronics I,II, Labs /Electrical Engineering Department of Tabriz University, 2005-2007
- Electronics I,II, Mathematical Engineering, (B. Sc.) /Electrical Engineering Department of Sahand University of Technology, 2002-2005
- Modern Control, C⁺⁺(B. Sc.) /Electrical Engineering Department of Sahand University of technology, 2002-2005

Thesis Supervisor

- Design of Photodetector Engineering with Plasmonic Properties (Bs Thesis; Supervisor)
- Design and Modeling of Very Narrow Band-pass Radio Frequency Filter for Optical Pressure Sensor (Bs Thesis; Supervisor)
- Design and Modeling Interdigitated Capacitor-Spiral Inductor Resonator for Optical Pressure Sensor (Bs Thesis; Supervisor)
- Biomedical Device for Early Breast Cancer Detection: Device Performance Improving by Plasmonic-Photonic Mask. (MSc Thesis; Supervisor)
- High-sensitive solar cell (PhD Thesis; Co-supervisor)

Project Management

- Laser radar design and implementation (2007-2008)
- Design and implementation of the radar transceiver operating at X-band (2008-2010)
- Design and implementation of the radar transceiver operating at S-band (2010-2011)
- Conceptual and detailed design of the radar receiver operating at 77 K (2011-2014); design of the LNA, Mixer, VCO, and IF amplifiers