

## SINA M. ABOUTORABI

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California State University, Northridge  
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### Professional Summary

Experienced electrical engineer, astronautical engineer and rocket scientist with a demonstrated **16 years** history of working, teaching, and learning in the interdisciplinary areas of electrical engineering, communications, telecommunications, and aerospace engineering. Skilled in astronautics, spacecraft systems, deep space communications coding, digital communications, algebraic coding schemes, satellite communications, wireless communications, mobile communications, radar signal processing, RF systems, antenna, and microwave engineering.

### Education

**Master of Science:** Electrical Engineering – Communication Systems (**Former Ph.D. Student in Electrical Engineering**), **USC Viterbi School of Engineering** – Los Angeles, CA  
Majoried in **Wireless & Digital Communications**, Minored in **Applied Mathematics** May 2018

Doctoral Supervisor: Late **Professor Solomon W. Golomb**, The forefather of Digital Space Communications, Signal Design, Information and Coding Theory

*Graduate Coursework* in Random Processes (EE562), Probability for Electrical Engineers (EE503), Communication Theory and Coding Schemes (EE564), Special Topics in Signal Design for Good Correlation (EE599), Mobile Communications (EE535), several units of EE790 (Directed Research), Principles of Radar (EE551), Topics in Stochastic Processes (Math606), Advanced Combinatorial Analysis (Math532), Applied Matrix Analysis (Math574), Reflector Antennas (EE578)

**Engineer's Degree (Professional Doctorate-equivalent):** Astronautical Engineering - with emphasis on Deep Space Communications Coding and Satellite Communications, **USC Viterbi School of Engineering** - LA, CA May 2018

**Master of Science:** Astronautical Engineering - with an emphasis on Space and Spacecraft Systems, **USC Viterbi School of Engineering** – Los Angeles, CA Dec 2015

*Graduate Coursework* in Systems for Remote Sensing from Space, Spacecraft Sensors, Spacecraft System Design, Special Topics in Spacecraft Communications, Spacecraft Power Systems, Space Environment and Spacecraft Interactions, Orbital Mechanics, Spacecraft Propulsion, Physical Gas Dynamics, Engineering Analysis

**Bachelor of Science:** Electrical Engineering – Electronics, **Qazvin Azad University** - Qazvin, IRAN June 2008

Some undergrad coursework in Design and Analysis of Electrical and Electronic Circuits (I)&(II), Electronics (I),(II)&(III), DSP, Communications Systems, Communication Electronic Circuits, Numerical Analysis, Differential Equations, Calculus (I&II), Probability and Statistics for Engineers, Engineering Mathematics, Electronics, Signals and Systems, AVR Controllers, Microprocessors, Computer Organization and Architecture, Computer Digital Circuits, Pulse Technique, Engineering Electromagnetics, Physical Electronics, Modern Physics Linear Control Systems, Industrial Control, Power Generation Control and Protection Systems

Thesis Title (grade: 20 out of 20): Designing the PCB layouts and fabricating three types of Powerful Full-transistor Wide Band and Digital Narrow Band FM Transmitters - 22/7/2008 Graduated in Top 2% of Class (Last Year GPA: 17.12/20 equal to A -)

### Teaching, Research, and Work Experience

#### **Part-Time Lecturer/Teaching Faculty**

9/2018 to present, **California State University, Northridge School of Engineering and Computer Science**, CSUN Department of Electrical and Computer Engineering and Department of Mechanical Engineering – Northridge, CA

- Lecture on undergraduate and graduate-level courses such as Linear Systems (ECE350), Rocket Propulsion (AE572), and Thermodynamics (ME370).
- Supervise students' term projects, monitored their course progress, and utilized innovative methods of instruction, including video, interactive class activities and discussions to present course material.

#### **Chief Technology Officer and Vehicular Communications System Architect**

9/2018 to 5/2019, **Fare Share, Inc. (Jasper)** – Los Angeles, CA

- Designed a backbone V2V/V2I COMM system for platooning semi-autonomous vehicles
- Analyzed and modeled multipath components of a rapidly time-varying MIMO fading channel
- Performed qualitative and quantitative analysis of semi-autonomous vehicle platooning.

- Conducted some research and drafted memos, reports, and summaries on mobile, vehicular, and millimeter-wave communications as well as dedicated short-range communications (DSRC).

#### **Graduate Research Assistant**

9/2017 to 5/2018, **Wireless Devices and Systems Group, USC Communication Sciences Institute**, Paul Allen Wireless Test Facility – Los Angeles, CA

- Researched extensively in the area of mm-Wave MIMO vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications
- Reviewed METRANS and Vienna project materials in the field of mobile and vehicular communications
- Started to implement the initial phase of NIST project: LabVIEW programming, configuring the NI-USRP channel sounder, FPGA and base-band processor, vehicle-to-vehicle (V2V) propagation channel estimation and modeling
- Prepared materials for weekly reports and presentations.

#### **Graduate Research Assistant**

6/2014 to 8/2017, **USC Communication Sciences Institute** – Los Angeles, CA

- Performed extensive research in the areas of deep space communications coding, radar signal design such as constructions of Costas arrays, digital space communications, algebraic coding theory (specifically finite field theory and number theory), and satellite communications.
- Prepared materials for reports, presentations, and submission to peer-reviewed conferences and journal publications. Analyzed acquired information and presented it to the supervising professor. Planned, modified, and executed research techniques, procedures, and tests.

#### **Graduate Teaching Assistant and Physics Lab Instructor**

1/2013 to 5/2014 **University of Southern California** – Los Angeles, CA

- Physics 151 Lab (Mechanics and Thermodynamics) - Spring 2013 & Spring 2014
- Physics 152 Lab (Electricity and Magnetism) - Fall 2013.
- Instructed, managed, and trained science and engineering students to complete their weekly assigned lab experiments.

#### **RF Engineer, Control and System Engineer**

6/2012 to 8/2013, **USC Information Sciences Institute** – Marina del Rey, CA

- Nano-Sat Build and Launch: Ground Station Testing and Data Reception for the Aeneas Cube-Sat, Tracked the Nano-Sat with the Satellite Tool Kit (STK) software
- Lunar Lander Exploration System Development: LEAPFROG Guidance, Navigation, and Control (GNC & IMU)

#### **Mathematics Tutor**

2/2012 to 1/2013, **USC Center for Academic Support**, Student Union – Los Angeles, CA

- Tutored hundreds of undergrad students in private sessions with detailed lesson plans, assessed students' progress, and communicated with students about outcomes.
- Taught students struggling with differential equations, engineering mathematics, college statistics, probability theory, linear algebra, integral and differential calculus, trigonometry, and analytical geometry.
- Implemented a peer tutoring system to enhance a comprehensive understanding of math techniques and increased students' test scores.

### **Employment History**

#### **Executive Director (President) and Member of the Board of Directors**

1/2010 to 8/2011, **Arsham Barsam Electric Company** – Qazvin, IRAN

- Installation, maintenance, and configuration of wireless modems, routers, ethernet hub/network switches, DSLAM and telecommunication devices, Intranet, SHDSL, VDSL and ADSL for internet services providers.
- Managed and directed staff of 19 personnel and managed budget totaling.
- Assisted with the creation of the marketing strategy and advertising initiatives that were used to promote the company to the public.
- Tracked trends and suggested enhancements that would both challenge and refine the company services.
- Partnered successfully with telecommunications industries and power electric producing companies.
- Maintained project quality with a hands-on management style. Developed and rolled out new policies.
- Trained, coached, and mentored staff to ensure smooth adoption of a new program.

### **Board Member (Treasurer and Secretary), Research Unit Director, Inventor, and Elite Member**

9/2007 to 8/2011, **Qazvin Inventors and Elites/Geniuses Society** (A nonprofit and non-governmental organization which is very similar to any think-tank association or Mensa International organizations) – Qazvin, IRAN

- Implemented marketing strategies which resulted in some mass productions of industrial patents and inventions.
- Validated schematic designs working alongside hardware engineers.
- Helped prepare inventors to participate and compete in the International Federation of Innovations Geneva and International Federation of Inventors Associations (IFIA) competitions.
- Took part in numerous national scientific competitions, innovation showcases, and science fairs either as a judge or a participant. Disseminate invention and innovation culture and demonstrate its role in sustainable development.
- Researched and updated all required patented research materials needed for firms and partners.
- Analyzed innovation documents for appropriate patent filing. Acquired documents, clearances, patent certificates, and approvals from local, state, and federal agencies for the inventor members.
- Assisted various business groups with document organization and dissemination during acquisitions.

### **Telecommunications Specialist, Network and Optical Fiber Communications Engineer**

11/2008 to 4/2010, **Telecommunication Company of Iran (TCI)**, Ministry of Information and Communications Technology (ICT), **Technical Support Department of Mobile and Metropolitan Communications** – Qazvin, IRAN

- Installment, maintenance, supervision, and technical support of the following units:
  1. PSTN/ISDN Access Network: Optical Fiber Communications and Optical Network Units (SONET, SDH, PDH),
  2. Reception and Transmission Terminals: Microwave and Radio Systems,
  3. WLL (CDMA, TDMA, UMTS, PHS, GSM, WiMAX, and satellite internet access)
  4. Cellular Networks, Mobile Switching Centers and Fixed Telephone Networks
- Developed and implemented complex Internet and Intranet applications on multiple platforms.
- Designed a strategic plan for component development practices to support future projects.
- Monitored network performance and provided network performance statistical reports for both real-time and historical measurements.
- Recommended architectural improvements, design solutions, and integration solutions.
- Trained junior members of the IT team regarding network security and troubleshooting of data circuits.
- Provided documentation on start-up, shut down and first level troubleshooting of processes to help desk staff.

### **Robotics and Mechatronics Engineer**

2/2005 to 3/2007, **Team Contributor of the Rescue Real Robotic League, Mechatronics Research Lab (MRL)**, QIAU –Qazvin, IRAN

- RF Circuit/PCB Designer. Specialized in MATLAB Simulink programming, computer vision algorithm, robot learning, and artificial neural networks. Managed R&D projects, including timelines and deliverables.
- Identified & developed research programs and performed routine lab maintenance tasks.
- Solved complex problems in synthesis, formulation, processes, testing, and root causes.
- Optimized existing formulation and processes to improve product performance, process robustness, and safety while reducing costs. Performed validation and testing of engineering models to ensure adequacy.
- Operated computational analysis software and established numerical techniques to analyze the robotic design and electrical/mechanical sequences to predict performance metrics. Conducted an extensive design of experiments to target variables of interest.
- Maintained fundamental knowledge of state-of-the-art engineering applications, computational analysis tools, product design methods, specification regulations, product specifications, patents, and industry trends.

## **Recognition Awards, Research Accomplishments, and Academic Achievements**

1. **National Award Recipient and Laureate** of the "**3rd Khwarizmi Festival**" among more than 30,000 students, Math Section of the Festival, Iran International Conference Center, Tehran, IRAN, Dec 2000 (Submitted math paper was titled "Sub-Sequence Progressions with Variable Common Ratio". Later on, this paper was developed to the Unclassified Infinitely Countable Generated Sequences with Progressive Common Ratio.)
2. **Association of Professors and Scholars of Iranian Heritage (APSIH) Award** for the Recognition of Achievement in Graduate Level Education, Los Angeles, UCLA, U.S., May 2019
3. **Engraved Trophy of Qazvin Inventors and Geniuses/Elites Society (QIGS)** to appreciate my academic and research achievements and to recognize my leading and managerial contributions, National Youth Organization, IRAN, June 2011

## Programming Languages and Software Skills

- **MATLAB:** SIMULINK, M-file programming, DSP System, Signal Processing, Communications System, RF, Phased Array System, and Antenna Toolboxes
- **PROGRAMMING & CODING LANGUAGES:** Java, Python, JavaScript, C#
- **Statically and Dynamically Typed Languages:** C/C++, LabVIEW Programming
- **Electrical & Mechanical Simulation Software:** HSPICE, ORCAD, PROTEUS, PROTEL, ModelSim, VHDL, Verilog, CMOS VLSI Design, ECAD, CAD, Antenna Design & Simulation, FPGA, IC and PCB layouts (EDA)

## Professional Memberships and Society Affiliations

- ❖ California Faculty Association (**CFA**), Active Membership 2019 – present
- ❖ University of Southern California (**USC**) Alumni Association, Alumnus Membership 2018 – present
- ❖ Association of Professors and Scholars of Iranian Heritage (**APSIH**), Doctoral Student Membership 2016 – present
- ❖ Institute of Electrical and Electronics Engineers (**IEEE**), Young Professionals Membership 2013 – present
- ❖ American Institute of Aeronautics and Astronautics (**AIAA**), Student Membership 2011 – present
- ❖ American Mathematical Society (**AMS**), Membership 2005 – present
- ❖ Mathematical Association of America (**MAA**), Membership 2011 – present
- ❖ Iranian Association of Electrical and Electronics Engineers (**IAEEE**), Associate Membership 2009 – present
- ❖ Iranian National Elites Foundation (**INEF/BMN**), Elite Membership 2006 – present. [www.bmn.ir](http://www.bmn.ir)
- ❖ Iranian Young Researchers and Elite Club (**YRC/BPJ**), Researcher Membership 2001 – 2006. [www.bpj.iau.ir](http://www.bpj.iau.ir)
- ❖ Iranian Organization for Engineering System/Order of Building and Construction (**IRCEO**), Qazvin Construction Engineering Organization (**QCEO**), Committee of Electrical Engineers Membership 2009 – present. [www.qeng.ir](http://www.qeng.ir)
- ❖ Qazvin Association of Electrical and Electronics Engineers (**QAEEE**), Associate Membership 2009 – present
- ❖ Qazvin Inventors and Geniuses/Elites Society (**QIGS**), Board, Elite, and Inventor Membership 2007 – present
- ❖ **QIAU** Scientific Society for Electrical & Biomedical Engineers, Assistant Director Membership 2005 – 2007
- ❖ Qazvin Student Research Center, **Head of the Mathematics Group**, Researcher Membership 2004 – 2008
- ❖ Qazvin Mathematical House (**QZMATHOUSE**), Scholar Membership 2001 – 2005

## Nationally Registered Patents

11/8/2009 "**Full Transistor High Power Wide Band FM Transmitter with the Adjustable Output Power and Frequency Tunings**" and "**9-Volts Low Power Narrow Band FM Transmitter**" designed by Sina Aboutorabi, patented by the Iranian Department for Companies Registration and Industrial Property, the State Organization for Registration of Deeds and Real State, Tehran, Iran

## Some Related Web Links

- ❖ <https://academics.csun.edu/faculty/sina.aboutorabi>
- ❖ <https://minghsiehee.usc.edu/2017/05/learning-unsolvable-problems/>
- ❖ <http://www-scf.usc.edu/~hajiseyy/>
- ❖ <https://www.linkedin.com/in/sina-aboutorabi-52913252/>
- ❖ <https://www.isi.edu/centers/serc/directory>
- ❖ <https://scholar.google.com/citations?user=DdTCu4IAAAAJ&hl=en>
- ❖ [https://www.researchgate.net/profile/Sina\\_Aboutorabi](https://www.researchgate.net/profile/Sina_Aboutorabi)
- ❖ <http://usc.academia.edu/SinaAboutorabi>

## Certifications

1- Huawei Access Network, 2- Huawei C&C08 Engineering Training 3- Training Course in Principles of Telecommunications Switching (Fundamentals of Transmission Systems), 4- Programmable Logic Controller (PLC), 5- CRLA's International Tutor Training Program (ITTP) Certification for Master Certified Tutor, 6- Professional Certificate on Improving Management Skills (Building and Breeding an Innovative and Creative Environment), 7- Educational Certificate on the Basics of the Founding Board (How to Become an Entrepreneur), 8- Certificate on the CSU Data Security & Privacy, 9- Endorsement Certificate for Private Pilot Ground School, and 10- Two Educational Certificates on New Technologies of Construction Industry