Alek M. Yegazarian

M.S. in Electrical Engineering · Computational Imaging, Medical Devices, and Robotics

Los Angeles, California

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Bio

Researchers solve problems. Magicians create wonder. I like doing both. Hey there, I'm Alek, a second-degree black belt, pianist, and magician who also happens to be an academic passionate about building systems that see and understand the world. Receiving a M.S. in Signal & Image Processing from USC, I was honored with the USC Viterbi outstanding academic achievement award and selected as the 2025 Viterbi Master's Student Commencement Speaker. Before USC, my studies involved a B.S. in Computer Engineering (Summa Cum Laude) with a Computer Science Minor from Loyola Marymount University. Along the way, I've explored the intersection of technology and creativity through research in biomedical computational imaging, 3D vision, and robotics, and through engineering roles at Northrop Grumman and NASA Jet Propulsion Laboratory. My work has included projects addressing high-speed medical imaging, sustainable deep learning, and neural scene reconstruction using Gaussian splatting. Whether it's crafting elegant solutions or a clever card trick, I bring curiosity, creativity, attention to detail, and a love for both structure and surprise to every challenge I take on.

Education

University of Southern California — *Los Angeles, CA*

M.S. in Electrical Engineering, Signal & Image Processing Emphasis — *Aug 2022 - May 2025*

- 2025 Viterbi School of Engineering Master's Student Commencement Speaker | Outstanding Academic Achievement Award | GPA: 3.85/4.0
- Conducted research with Dr. Yue Wang on neural rendering and neural scene representations
- Relevant Coursework: Digital Image Processing, Machine Learning I, Machine Learning II, Advanced Computer Vision, Digital Signal Processing

Loyola Marymount University — *Los Angeles, CA*

B.S. in Electrical Engineering, Computer Engineering Emphasis; Minor in Computer Science — *Aug 2018 - May 2022*

- Summa Cum Laude | GPA: 3.93/4.0
- Elected to Tau Beta Pi and Alpha Sigma Nu honor societies
- Conducted research with Dr. Hossein Asghari on real-time volumetric optical coherence tomography biomedical imaging
- Relevant Coursework: Artificial Intelligence, Computer Graphics, Data Structures & Algorithms, Computer Architecture, Linear Systems

Skills

Technical Languages: Python, C++, ARM Assembly, MATLAB, LaTeX
Frameworks & Tools: CUDA, OpenGL, NumPy, Pandas, Matplotlib, PyTorch, Scikit-Learn, FFmpeg, Git, JIRA, SLURM
Hardware: Lasers, Spectrometers, Galvanometers, Collimators, Lenses, Fiber, Acousto-Optic Deflectors, Photomultiplier Tubes

Research Experience

University of Southern California Media Communications Laboratory — *Los Angeles, CA*

Summer Research Assistant, Advised by Dr. C.-C. Jay Kuo — *May 2025 – Aug 2025*

- Improved sustainable deep learning method, Green U-Shaped Learning (GUSL), performance for image denoising and super-resolution by ~30%

University of Southern California Geometry, Vision, and Learning Laboratory — *Los Angeles, CA*

Research Assistant, Advised by Dr. Yue Wang — *Jan 2024 – Jan 2025*

- Implemented lab-wide accessible Gaussian splatting pipeline, a state-of-the-art approach to neural scene representations, on USC's high-performance computing cluster
- Explored robotics simulation and pose estimation free solutions for Gaussian splatting, a state-of-the-art approach to neural scene representations

Loyola Marymount University Photonics Laboratory — *Los Angeles, CA*

Research Assistant, Advised by Dr. Mohammad Hossein Asghari — *Oct 2019 - May 2022*

- Improved framerate of volumetric Optical Coherence Tomography imaging system from ~8 frames per second to ~60 frames per second
- Developed ~$80 wireless adaptable warning system to notify personnel entering lab that a laser is on, using a controllable illuminated sign
- Researched novel methodologies for real-time volumetric imaging and nanometer-resolution interferometry, using parallel programming techniques for optical coherence tomography and swept-source laser applications

Publications

Ultrafast Time-Stretch Optical Coherence Tomography with GPU Accelerated Post-Processing

Alek Yegazarian, Hossein Asghari

Union Radio-Scientifique Internationale / International Union of Radio Science (URSI), 2021

Industry Experience

Northrop Grumman *Northridge, CA*

Principal Digital Engineer *Oct 2022 - Present*

- Digital engineering lead for German Eurofighter and autonomous systems research and development programs
- Co-led worldwide (diverse geographic) team of 7 design engineers to fulfill corporate sector operating objectives for processes and metrics
- Tested and diagnosed software, firmware, and hardware architecture failures across 4 different circuit card designs
- Mentor 2 interns and 1 associate engineer across 2 projects

NASA Jet Propulsion Laboratory *Pasadena, CA*

Avionics Testbed Engineer (Engineering Undergraduate Student) *Nov 2021 - Oct 2022*

- Supported 50 + hardware integrations and anomaly investigations for the Europa Clipper spacecraft camera and spectrometry instruments
- Developed, verified, and automated 6 test procedures and python scripts for the spacecraft avionics system testbeds

Northrop Grumman *Northridge, CA*

Electrical Engineering Intern *Jun 2020 - Oct 2021*

- Collaborated with programmable logic team within flight electronics development laboratory, while learning and practicing FPGA architecture design using VHDL, oscilloscope and power supply operation, Circuit Card Assembly debugging and testing, and soldering custom adaptor cables

Teaching Experience

Loyola Marymount University *Los Angeles, CA*

Electrical & Computer Engineering Department Part-Time Faculty, Lecturer *Aug 2024 – Present*

- Taught Fall 2024 4-credit EECE 3140 Microprocessors and Microcontroller Systems (Computer Architecture) course comprising 18 students and 1 teaching assistant. Teaching Evaluation Score: 4.85/5.00
- This course introduced the student to the basic concepts in the design and organization of microprocessor/microcontroller systems. The student learns assembly and C programming languages for solving applications and interfacing with peripheral devices

Projects

Supervised Machine Learning Methods for Infrared Thermography *Jan 2024 - May 2024*

- Implemented, optimized, and compared 4 supervised regression methods (random forest, support vector regression, multi-layer perceptron, k-nearest neighbors) to impute oral temperature from a 1020x114 infrared thermography dataset
- Performed hyperparameter tuning across 9 feature preprocessing techniques prior to 5-fold cross-validation and model selection

D-VIG: A Diffusion-Based Visually-Indicated Sound Generator *Aug 2023 - Dec 2023*

- Applied a PyTorch-based diffusion model to the problem of visual-to-sound generation
- Replicated three state-of-the-art Long Short-Term Memory (LSTM)-based and Generative Adversarial Network (GAN)-based visually-indicated sound models to benchmark D-VIG

High-Speed and Sensitive Optical Coherence Tomography Biomedical Imaging System *Oct 2019 - May 2022*

- Improved ~8 frames per second system, utilizing CUDA and OpenGL within C++, producing GPU-accelerated software that performs Fast Fourier Transform processing and volumetric data visualization at ~60 frames per second
- Integrated acousto-optic deflector and photomultiplier tube to improve system's laser scanning speed and photodetector sensitivity, respectively

Wireless Automated Laser Sign *Jan 2020 - Feb 2020*

- Designed and created a ~$80 wireless adaptable warning system for the LMU Photonics Laboratory to notify personnel entering lab that a laser is on
- Studied and programmed Xbee communicators, an Arduino, and a TCS3200 color sensor to realize a system that can monitor multiple lasers' status

Honors & Awards

Academy of Magical Arts Junior Society at the Magic Castle, Hollywood, The Alek Yegazarian Scholarship *Jul 2025*
University of Southern California, 2025 Viterbi School of Engineering Master's Student Commencement Speaker *May 2025*
University of Southern California, Electrical & Computer Engineering Outstanding Academic Achievement Award *May 2025*
Tau Beta Pi Engineering Honor Society, Member *Nov 2021 - Present*
Alpha Sigma Nu Honor Society, Member *Nov 2021 – Present*
Loyola Marymount University, Summa Cum Laude *May 2022*
World Taekwondo Federation, Second-Degree Black Belt *Jan 2013*

Professional Services

Loyola Marymount University Electrical & Computer Engineering Advisory Board, Vice Chair *Aug 2023 – Present*
University of Southern California, DEN@Viterbi Ambassador *Jun 2025 – Present*
Academy of Magical Arts (Magic Castle, Hollywood), Magician Member, Former Junior Society Member *Aug 2018 – Present*
Loyola Marymount University Electrical & Computer Engineering Department, Capstone Project Mentor *Aug 2023 - May 2024*

Talks

Ultrafast Time-Stretch Optical Coherence Tomography with GPU Accelerated Post-Processing

National Conference on Undergraduate Research (NCUR), 2022

Hobbies

Self-Taught Pianist *Aug 2023 - Present*

Magician *Jun 2016 – Present*

Taekwondo Practitioner *Aug 2005 – Present*