

Enrique Alberto Segura Carrillo

CONTACT INFORMATION

Enrique Alberto Segura Carrillo
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EDUCATION

Master of Science, Physics - California State University, Los Angeles - June 2021
Bachelor of Science, Physics - University of California, Los Angeles - Los Angeles, CA

AWARDS

Graduate Equity Fellowship	June 2020
NIH MBRS-RISE MS-to-PhD Fellowship	June 2020
Sally Casanova Scholar	May 2020
SLAC Alonzo W. Ashley Research Fellowship	November 2017

PUBLICATIONS

Goldrick, Ciarán Mc, Mark Matney, Enrique Segura, Youngtae Noh, and Mario Gerla (2015). "WaterCom: A Multi-level, Multipurpose Underwater Communications Test Platform". In: *Proceedings of the 10th International Conference on Underwater Networks & Systems*. WUWNET '15. Arlington, VA, USA: ACM, 14:1–14:8. ISBN: 978-1-4503-4036-6. DOI: [10.1145/2831296.2831336](https://doi.org/10.1145/2831296.2831336). URL: <http://doi.acm.org/10.1145/2831296.2831336>.

Mc Goldrick, Ciarán, Enrique Segura, Tianyan Wu, and Mario Gerla (2016). "WaterCom: Connecting Research Configurations with Practical Deployments: A Multilevel, Multipurpose Underwater Communications Test Platform". In: *Proceedings of the 11th ACM International Conference on Underwater Networks & Systems*. WUWNet '16. Shanghai, China: ACM, 8:1–8:2. ISBN: 978-1-4503-4637-5. DOI: [10.1145/2999504.3001118](https://doi.org/10.1145/2999504.3001118). URL: <http://doi.acm.org/10.1145/2999504.3001118>.

RESEARCH

Microelectronics Intern Researcher June 2020 - September 2020
The Aerospace Corporation, El Segundo, CA

- Will develop simulations of physical devices under radiation effects for space applications, implement physics-based model and perform electrical characterization of microelectronic devices to test model's accuracy.

Graduate Student Researcher January 2020 - Present
California State University, Los Angeles, Los Angeles CA

- Working on experiment automation of Keithley nanovoltmeters, probes and oscilloscopes using LabView and Python to implement a feedback controller to measure spin to spin relaxation time using NMR techniques.

Visiting Researcher November 2018 - November 2019
UCLA Network Research Laboratory, Los Angeles, CA

- Developed implementation of a Quantum Neural Network (QNN) to study the near term gate quantum computer model using Google's Cirq.
- Tested QNN on a toy-model representing a Stern-Gerlach device under bit-flipping and on 2D Ising model with transverse field.
- Designed a pedagogical colab notebook as a tutorial showcasing this implementation.

Science and Engineering Associate I November 2017 - November 2018
SLAC National Accelerator Laboratory, Menlo Park, CA

- Developed Physical Optics Propagation simulations of a Gaussian beam and a flat-top beam propagated on a laser transport comprised of a series of telescopes and mirrors under random perturbations using ZEMAX.
- Created numerical model to predict effects of thermal changes in a laser system intended for Plasma Wake-field Particle acceleration.
- Developed an algorithm by using the detected changes in laser position across the transport, the numerical model, and a PID-controller to stabilize the laser system.
- Designed and built a two-mirrors-two-CCDs system with pico-motors to characterize the effects of hysteresis in the algorithm's performance.
- Applied image processing using template matching and low-pass filters to recognize, differentiate, and track the intended laser spot across the laser system.
- Algorithm stabilize the effects of thermal fluctuations by a factor of 40 in 24-hour period.

- Algorithm's feedback enables experiments to run 24/7, dramatically improving from the previous thermally-imposed experimental time-window of 10 pm - 8 am.
- Algorithm's control allows uninterrupted experimental runs removing the need for a time-consuming manual alignment every 30 minutes.
- Presented project's results to LCLS team at SLAC to showcase its potential as a suitable feedback method for LCLS's beamline.

Undergraduate Researcher

Summer 2015 - Summer 2017

UCLA Network Research Laboratory, Los Angeles, CA

- Developed web infrastructure to remotely schedule experiments.
- Prepared embedded hardware for experiments by developing parallel compilation of NRL's MPTCP Linux Kernel on Raspberry Pis.
- Executed data acquisition of vehicular and underwater wireless experiments.
- Implemented data analysis of experimental data to quantify network traffic trade-offs between TCP vs MPTCP.

**ADDITIONAL
TRAINING**

Princeton Plasma Physics Laboratory Graduate Summer School

Summer 2019

SLAC Summer Institute

Summer 2018

SLAC Machine Learning Applications for Particle Accelerators Mini-Workshop

Spring 2018

POSTER

Segura Carrillo, Enrique (2019). *Mitigating Slow-Drift Effects for Plasma Wakefield Particle Acceleration*. Princeton, NJ, USA: Princeton Plasma Physics Laboratory Graduate Summer School.

TEACHING

Graduate Assistant

Fall 2019

California State University, Los Angeles, Los Angeles, CA

- Supported laboratory physics course focused on experimental debugging to teach physics concepts.

CSL Fellow

Fall 2016, Winter 2019

Hispanic Heritage Foundation, Washington, D.C.

- Developed computer science fundamentals course at Telfair Elementary using Scratch during Winter 2019.
- Provided programming fundamentals workshop at San Fernando High School Magnet's AP Computer Science course using Java during Fall 2016.

Computer Science Instructor

Summer 2017

SMASH Academy, University of California, Los Angeles

- Developed computer science fundamentals course on Python for gifted high school students.

Computer Science Instructor

Spring 2017

ACM TEACH LA, UCLA Lab School, Los Angeles, CA

- Co-lead on a computer science course for gifted fifth graders at UCLA Lab School using Python.

SKILLS

Python, LabVIEW, MATLAB, Linux, Raspberry Pi 3, Arduino, Fortran, Zemax, Cirq, Qiskit, Mathematica.