Rafael Alberto Rivera-Soto

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Undergraduate researcher at Lawrence Livermore National Laboratory. Passionate about the possibilities of the intersection between Artificial Intelligence and Computer Security.

Employment

Lawrence Livermore National Laboratory **Livermore,CA**
Computer Scientist *September 2015–Present*

- **YubNub:** Researching neural network models to identify the author of a particular source code sample.
- **Electric Stellata:** Created convolutional neural network models for identifying the compilers, versions and flags that were used to create a binary file. Research is still ongoing.
- **CyDER:** Created a NARX neural network model for modeling the amount of PV generation in a particular installation.
- **CES-21:** Built various models for a coupled transmission-communication simulation for studying the effect of cyber attacks on the power grid transmission system.

Education

Academic Qualifications

Universidad del Turabo **Gurabo, Puerto Rico**
Bachelor of Science, Computer Engineering, Cumulative GPA 3.78 *2012–2015*

Thomas Alva Edison School **Caguas, Puerto Rico**
High School *August 2009–May 2012*

Internships

Lawrence Livermore National Laboratory **Livermore, CA**
Undergraduate Intern–Cyber Defenders Student Program *June 2015–August 2015*

- Created an authentication system for an internal web application. The system is able to account for access from three different security classification networks and adjust accordingly.

Lawrence Livermore National Laboratory **Livermore, CA**
Undergraduate Intern–Cyber Defenders Student Program *June 2014–August 2014*

- Designed a model which describes the amount of time it takes a power grid network to recover to against a certain amount of damage.
- Created a simulation to study the robustness and resilience of the power grid against various attacks.

Lawrence Livermore National Laboratory **Livermore, CA**
Undergraduate Intern–Cyber Defenders Student Program *June 2013–August 2013*

- Designed a model which describes the effect of cascading power failures in a power grid network.
- Implemented a simulation to study the resilience of different network models against various types of attacks.

Leadership Experience

- Founding board member of the ACM (Association for Computing Machinery) and Tau Alpha Omega chapters at the University of Turabo.
- Organized student workshops and documented reunions for the Association for Computing Machinery.

Technical and Personal skills

- **Programming Languages:** C, C++, Python, Bash, LaTeX
- **Computer Forensic Tools:** IDA, OllyDbg, Autopsy
- Fluent Spanish and English speaker

Achievements

Universidad del Turabo — **Gurabo, Puerto Rico**
Member of the Tau Alpha Omega Engineering Honor Society — *March 2014–Present*

Universidad del Turabo — **Gurabo, Puerto Rico**
Caribbean Computer Center of Excellence scholar — *August 2012–August 2014*

San Juan, Puerto Rico
Presenter at Puerto Rico Researchers Council — *March 7, 2014*

Dominican Republic
Participant at Caribbean Finals, ACM-ICPC — *November 9, 2013*

University of Puerto Rico — **Bayamon, Puerto Rico**
Second place in the ACM-ICPC Puerto Rico National Competitions — *October 5, 2013*

University of Puerto Rico — **Bayamon, Puerto Rico**
Second place in the UPR-Bayamon Computer Programming Competition — *April 27, 2013*

Publications

[1] Jonathan Coignard, Thierry Nouidui, Christoph Gehbauer, Michael Wetter, Jhi-Young Joo, Philip Top, Rafael Rivera Soto, Brian Kelley, and Emma Stewart. Cyder - a co-simulation platform for grid analysis and planning for high penetration of distributed energy resources. 2017.

[2] José O Nogueras Colón, Yahya M Masalmah, Christian Martinez Nieves, and Rafael Rivera Soto. A proposed desktop grid/cloud computing network design for hsi target detection applications. 2015.

[3] Yahya M Masalmah, Christian Martínez Nieves, Rafael Rivera Soto, Carlos Velez, and Jenipher Gonzalez. A framework of hyperspectral image compression using neural networks. In *Latin American and Caribbean Conference for Engineering and Technology Proceedings*, volume 13. Univ. del Turabo (Puerto Rico), 2015.

[4] Philip Top, Eddy Banks, Peter D. Barnes Jr., Seth Bromberger, Brian M. Kelley, Rafael Rivera Soto, Benjamin Salazar, Steven G. Smith, and Nathan Yee. Simulation of a rtu cyber attack on a transformer bank. 2016.