

SEBASTIAN HURTADO PARRA

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EXPERIENCE

Research Assistant

Philadelphia, PA

University of Pennsylvania

2016 - present

- Built a novel ultrafast spectroscopy detection scheme requiring low-level C/LabVIEW programming using instrument drivers, optimizing signal/noise metric by over 100x, and reducing collection time by 10x
- Designed and deployed an end-to-end LabVIEW framework to suppress laser noise, increasing a stability metric by over 20x
- Performed custom nonlinear regression analysis on data, and incorporated signal transformation and data cleaning pipelines in Python and LabVIEW using e.g. singular value decomposition
- Developed real-time image analysis LabVIEW software including gradient descent minimization of image overlap, which reduced storage cost by 100x, and improved data collection time and quality by 2x
- Collaborated with various research groups both within and outside the university to create custom measurement solutions and solve complex research problems, leading to 7 peer-reviewed publications
- Managed day-to-day lab operations, mentored junior students, and communicated with principal investigator and colleagues

Teaching Assistant

Philadelphia, PA

University of Pennsylvania, Saint Joseph's University

2013 - 2017

- Planned and implemented weekly lesson plans for groups of 20-30 undergraduate students
- Guided students through lab procedures and led group study sessions

SKILLS

Languages: (Proficient) Python, LabVIEW; (Basic) Bash, C/C++, Java, SQL

Tools: Linux sysadmin, Git, Jupyter, Numpy, Matplotlib, Pandas, Scikit-Learn, \LaTeX

Linguistic: Native fluency in English and Spanish

PROJECTS/OTHER

eyeHUD: Smart window application for bright object occlusion, utilizing OpenCV facial recognition. Won 3rd place at PennApps XIV (devpost.com/software/eyehud)

Cryptoino: Lightweight cryptographic key exchange using tree parity machine neural networks, aimed at low-power embedded devices. Top 30 at PennApps XV (devpost.com/software/cryptoino-4ax1tk)

NFL scores: Quantitative analysis on the effect of home field advantage in the NFL. Utilized Python for web scraping and data analysis (sebastianhp.com/NFL_HomeFieldAdvantage.html)

MatTrack: Particle tracking MATLAB library developed in undergrad research (github.com/ryanstull/MatTrack)

AWARDS & HONORS

UPenn: Arnold M. Denenstein Prize (physics.upenn.edu/index.php/news/sas-student-prizes-and-awards) 2019

PennApps XV: Cryptoino, Top 30 2017

PennApps XIV: eyeHUD, 3rd Place & Winner of Best Public Safety or Video Processing App 2016

EDUCATION

University of Pennsylvania

Philadelphia, PA

Ph.D. in Physics

expected May 2022

Saint Joseph's University

Philadelphia, PA

B.S. in Physics and Mathematics

May 2015