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*