

Samuel Rivera

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SUMMARY

Engineer with 10+ years of experience applying data science to cleaning and engineering raw data, implementing custom machine learning and statistical pattern recognition solutions, and delivering novel results on time and within budget

EDUCATION

THE OHIO STATE UNIVERSITY

PHD IN ELECTRICAL ENGINEERING

Dec 16, 2012 | Columbus, OH

Concentration in machine learning and statistical pattern recognition

MS IN ELECTRICAL ENGINEERING

March 18, 2012 | Columbus, OH

UNIVERSITY OF DELAWARE

BE IN ELECTRICAL ENGINEERING

May 15, 2007 | Newark, DE

Concentration in signal processing
Minors in Math and Physics

TECH STACKS

BUILDING: Python • PyTorch • Numpy • Scipy • scikit-learn • Pandas • seaborn • pytest • optuna • OOP
TOOLS: terminal • Docker • git
DOCS: \LaTeX • Markdown • Jira / Trello
PAST PROJECTS: R • MATLAB • Keras • TensorFlow • C • C++ • Julia

SOCIETIES & HONORS

2016 1st place team, AFRL LabHack Hackathon (Dayton, OH) • Tau Beta Pi • Eta Kappa Nu • Alpha Psi Lambda • Society of Hispanic Professional Engineers

PUBLICATIONS

Five journals and several conferences:
<https://samuelrivera.info/publications/>

EXPERIENCE

BALL AEROSPACE | PRINCIPAL ENGINEER, MACHINE LEARNING TEAM

March 29, 2021 – Present | Boulder, CO

- Implemented custom self supervised deep learning architectures for object detection using vision transformer and other backbones
- Implemented time-series forecasting models (VAR) for prediction
- Tuned and deployed deep networks on Linux servers with Docker containers
- Defined and built machine learning solutions to a variety of problems while mentoring junior engineers to help execute the work
- Developed the infrastructure to rapidly iterate over alternative algorithms for custom optimization problems (gradient descent, Bayesian optimization, etc.)
- Performed data analysis and visualization for deciding problem characteristics, solution feasibility, and solution approach from first principles and data insights
- Applied self-supervised deep learning (SSL) approaches for classification in impoverished data settings

MATRIX RESEARCH | RESEARCH ENGINEER, TARGETING AND NAV

April 28, 2016 – February 26, 2021 | Dayton, OH

- **ALGORITHMS AND TECHNICAL WORK**
 - Experienced in numerical Python ecosystem (Numpy/Scipy/scikit-learn), data analysis, visualization, modeling, OOP, and software best practices
 - Technical lead applying single-shot (YOLO) and region based (R-CNN) deep learning frameworks for automatic target recognition (ATR)
 - Improved detection accuracy (with synthetic data) over baseline by 30%
 - Published adversarial domain adaptation (GAN) algorithms for unsupervised transfer learning; applied these across multiple projects
 - Derived and implemented probabilistic graphical models (Bayesian networks) for signal ID in ambiguous radar environments
 - Implemented a multiple hypothesis tracker and performance prediction verification using physics based simulation libraries
- **LEADERSHIP AND BUSINESS DEVELOPMENT**
 - Oversaw all aspects of research including proposals, cost planning, algorithm derivation, implementation and deployment, and reporting
 - Mentored ATR Center Summer School student-researchers and interns in ML and research methods for satellite imagery and DNA classification

POSTDOCTORAL RESEARCHER | OSU, COG DEVELOPMENT LAB

September 13, 2013 – March 18, 2016 | Columbus, OH

- Developed neuroimaging (EEG) and eye-tracking cognitive behavioral studies
- Data science for analyzing experiment data: ANOVA, mixed-effects models, hierarchical Bayesian models, Kohonen networks (self-organizing maps), regression, and visualizations using seaborn/matplotlib/MATLAB/R
- Worked in an interdisciplinary team of engineers and cognitive scientists to apply machine learning to cognitive development problems