Julian Collado

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EXPERTISE

Experienced Machine Learning Researcher with a PhD in CS specialized in deep learning for science. I have worked in image classification and generative models, LLMs and adversarial attacks. I currently work in ML for cybersecurity.
550+ citations including NeurIPS, 51k+ downloads of ML hyperparameter optimization library.

EDUCATION

Ph.D., Computer Science, University of California Irvine 2021
B.Sc. Physics, University of Costa Rica

SKILLS

Python, SQL, Linux, **Neural Networks** (PyTorch, Tensorflow, Keras)

EXPERIENCE

Blackberry-Cylance, Senior Machine Learning Researcher (Python, AWS, PyTorch) *Nov 2022-current*

- Enhanced customer experience with serial Large Language Models based systems.
  - Designed and trained a question answering system with factual constraints from a private knowledge-base
  - Developed a request interpretation and routing system for streamlined canned transactions
- Designed and built an approximate K-nearest neighbors (AKNN) similarity search product trained on massive high-dimensional TB-size dataset, resulting in enhanced automation and cyber intelligence capabilities.
  - Led the invention process, resulting in 356% KPI improvement and 3 patent applications.
  - Prioritized customer focused human interpretability, ensuring transparency and clarity in model outputs.

Blackberry-Cylance, Machine Learning Researcher (Python, AWS, PyTorch) *April 2021-Nov 2022*

- Made significant improvements to team's operational model training capabilities
  - Spearheaded model hyperparameter and compressibility studies which led to 30% reduction in error rate for Windows PE malware classification model
  - Reduced time required to train models in operational environment by 75%
  - Refactored multiple legacy machine learning code bases to operationalize evaluation of adversarial robustness
  - Added advanced error visualization capability to production model training workflow
- Designed and built team's adversarial attack/defense model training and evaluation code base, enabling high-quality reproducible distributed research on adversarial robustness
  - Responsible for all blue teaming model robustness efforts including multiple types of whitebox, blackbox and transferability attacks at varying levels of strength
  - Led quantization research which resulted in a 25x increase in computational costs for adversaries
  - Improved classification performance of class of adversarially robust malware models by 22%
- Interviewed candidates for Data Scientist, Machine Learning Researcher and Data Analyst positions

Electronic Arts, Data Scientist Intern (Python, Snowflake, SQL) *Summer 2019*

- Designed and implemented custom algorithms for a recommender system for in-game items based on player preferences using implicit and explicit data. Improved top 5 precision by 450%. Presented results directly to CMO
- Models used include collaborative filtering, matrix factorization and custom machine learning models.

Blizzard Entertainment, Data Analyst Intern (Python, SQL) *Summer 2018*

- Designed a model to predict high impact, emergent issues ahead of time leading to 50% accuracy improvement
- Worked in a global team of data analysts and engineers collaborating with cross departmental teams
- In person and virtual presentations to global vice-president and senior leadership

PUBLISHED RESEARCH (**550+ citations**) https://scholar.google.com/citations?user=RDIyuhoAAAAJ&hl=en

I develop and implement machine learning methods to solve problems in applied fields alongside subject matter experts.

- Created new generative model specially adapted for extremely sparse datasets and interpretable methods.
- Designed and trained random forests, gradient boosting, fully connected, convolutional and recurrent neural networks (LSTM) for particle physics which were implemented into production environment at CERN.
- Designed and developed open-source machine learning hyperparameter optimization library (**51k+ downloads)**