MARCELO PRATES, PHD

Data Scientist & Machine Learning Engineer

@ marceloorp@gmail.com in marceloprates marceloprates

EXPERIENCE

Lead Data Scientist

Dataside

Oct 2023 – Now São José dos Campos, Brazil (Remote)

- As a Lead Data Scientist, I manage multiple AI projects, lead sales efforts for DS & AI solutions, and mentor a team of data scientists.
- Key achievements:
  - Development of LLM-powered agentic systems and text-to-SQL agents
  - Implementation of advanced RAG solutions and structured output generation
  - Creation of custom chatbots and knowledge extraction systems
  - Design and deployment of sales forecasting models utilizing conformal prediction for reliable uncertainty estimates and quantile regression for explicit modeling of asymmetric risks between over/underestimation
  - Implementation of classification and regression solutions
  - Development of clustering and outlier detection systems
- Tech stack:
  - **Languages & Core**: Python, Julia, Javascript, C#, SQL, Bash
  - **AI & ML**: PyTorch, PyTorch Lightning, MLflow, Scikit-Learn, Scikit-Optimize, Optuna, PyCaret
  - **LLM & NLP**: Azure OpenAI, LangChain, RAG, HuggingFace, CrewAI, PydanticAI, LangGraph
  - **Data Engineering**: Databricks, Pandas, Polars, NumPy, Dask, PySpark, Pinecone, Weaviate, Chroma, PostgreSQL, Redis
  - **MLOps & Infrastructure**: Azure, Docker, GitHub Actions, MLOps
  - **APIs & Services**: FastAPI, Flask
  - **Computer Vision**: OpenCV, Open3D, Scikit-Image, Shapely

Large Language Models Consultant

Vortigo

Nov 2023 – Jun 2024 Porto Alegre, Brazil (Remote)

- As LLM consultant, I collaborated with a Brazilian tech company in the design and implementation of assistant ChatBots informed by proprietary source code and spreadsheet knowledge bases by leveraging OpenAI's paid API and pretrained Large Language Models such as GPT3.5 and GPT4.
- Tech stack:
  - **Languages & Core**: Python
  - **AI & ML**: PyTorch, PyTorch Lightning, Pandas, Scikit-Learn, NumPy, Jupyter Notebooks, AWS Sagemaker
  - **LLM & NLP**: OpenAI API, HuggingFace, LangChain, BertTopic

Sabbatical Period

To focus on my generative art projects

Apr 2023 – Oct 2023 Porto Alegre, Brazil

- I took a short sabbatical period to focus on my generative art projects and mantain / improve existing Python packages I had built to help me in my artistic process, including prettymaps

Machine Learning / Computer Vision Consultant

ConstructIN

Mar 2022 – Apr 2023 Porto Alegre, Brazil (Remote)

- As a senior ML & Computer Vision consultant, I spearheaded the design and implementation of advanced computer vision solutions for automated construction site monitoring using 360-degree photography, leveraging state-of-the-art deep learning architectures.
- Led a team of 3 data scientists in developing and deploying 4 production-ready computer vision applications, including a comprehensive analytics dashboard that enabled real-time construction progress monitoring through custom semantic segmentation models. The solution significantly improved project tracking efficiency and decision-making capabilities for clients.
- Tech stack:
  1. **Languages & Core**: Python
  2. **AI & ML**: TensorFlow, Keras, PyTorch, PyTorch Lightning, Pandas, Scikit-Learn, SciPy, NumPy, Matplotlib
  3. **Computer Vision**: Open3D, OpenCV, Scikit-Image
  4. **MLOps & Infrastructure**: AWS, Docker
  5. **APIs & Services**: Flask, Django

Generative Art Teacher

Responsive Cities

Nov 2022 Porto Alegre, Brazil

- Taught a course on generative art history & principles and on useful tools and libraries for creative coding

Principal Data Scientist

Condati

Nov 2021 – Dec 2023 Menlo Park, California (Remote)

SKILLS

- MLOps & Production ML
- LLMs & RAG Systems
- Computer Vision
- Graph Neural Networks
- Uncertainty Quantification
- Causal Inference
- System Design
- Technical Leadership
- ML for Healthcare
- ML for FinTech
- Geospatial Analytics
- Data Projects Management
- Azure Cloud Platform
- Databricks & Big Data
- Docker & Containerization
- CI/CD Pipelines
- SQL & Database Design
- Julia
- System Programming (C/C++)
- PyTorch & Lightning
- Pandas & Data Engineering
- LangChain Ecosystem
- Vector Databases
- MLflow & Experiment Tracking
- FastAPI & API Design

PROFICIENCY

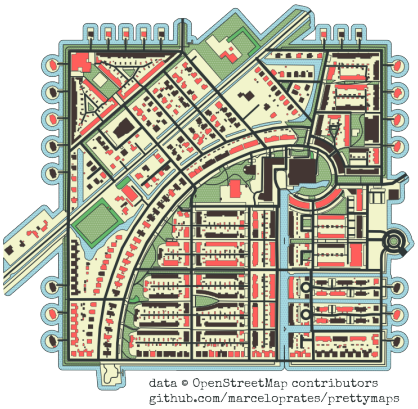
- Portuguese (native speaker)
- English
- Spanish

MOST PROUD OF

Gender Bias in Machine Translation
Our 2018 research measured the prevalence of male defaults in Machine Translation tools

VO2 Max for Samsung Galaxy Watch
Led the development and global deployment of VO2 max estimation feature, now available to millions of users worldwide

Prettymaps
Python library for drawing pretty maps from OpenStreetMap data (1st place on Hacker News, >11.000 stars, ranked among the 2000 most starred repositories on GitHub)



- As Principal Data Scientist, I led the redesign and optimization of ML solutions for digital marketing campaign bid strategies, achieving significant ROI improvements and meeting client KPIs through:
  - Implementation of advanced forecasting models and automated bidding systems
  - Development of robust monitoring and validation frameworks
  - Design of novel optimization algorithms for real-time bid adjustments
  - End-to-end MLOps pipeline implementation for model deployment and monitoring
- Successfully diagnosed and resolved critical performance issues, bringing model effectiveness back to target levels within one year.
- Tech stack:
  1. **Languages & Core**: Python, Julia
  2. **AI & ML**: PyTorch, TensorFlow.jl, Torch.jl, MLJ.jl, Flux.jl, Pandas, SciPy, NumPy
  3. **Data Engineering**: MySQL
  4. **MLOps & Infrastructure**: AWS Sagemaker

AI Researcher & Project Leader - ML for Health

Samsung Research Brazil

Mar 2020 – Nov 2021 | Campinas, Brazil (Remote)

- As AI Research Lead, I spearheaded the development of a groundbreaking ML-powered health monitoring solution for Samsung's wearable devices, leading to its global implementation in the Galaxy Watch line. Key achievements include:
  - Design and implementation of robust data collection protocols and ML architectures
  - Development of memory-optimized, real-time health monitoring algorithms
  - Successful deployment of production models on resource-constrained wearable devices
  - Direct presentation of project outcomes to Samsung headquarters, leading to worldwide adoption
- Led and mentored a cross-functional team of researchers and engineers, driving innovation in wearable health technology while meeting strict performance and resource constraints.
- Tech stack:
  1. **Languages & Core**: Python, Julia, C/C++
  2. **AI & ML**: TensorFlow, Keras, PyTorch, PyTorch Lightning, MLJ.jl, Flux.jl, Pandas, Scikit-Learn, SciPy, NumPy, Matplotlib
  3. **MLOps & Infrastructure**: AWS Sagemaker
  4. **Deployment**: C, ONNX, Custom Python-to-C transpilers, Samsung Tizen OS

Data Scientist

Poatek IT Consulting

Jun 2019 – Mar 2020 | Porto Alegre, Brazil

- As a Data Scientist, I led multiple high-impact projects across different domains, delivering innovative solutions through:
  - Development of exact and heuristic algorithms for complex vehicle routing optimization
  - Implementation of computer vision and NLP pipelines for automated document processing and data extraction
  - Design of advanced NLP solutions for Named Entity Recognition and sentiment analysis
  - Creation of sophisticated credit risk modeling systems
  - Development of geospatial data analysis and visualization frameworks
- Successfully integrated various ML/DL technologies including CNNs, ensemble methods, and pre-trained language models to enhance solution performance.
- Tech stack:
  1. **Languages & Core**: Python, Julia, C/C++
  2. **AI & ML**: TensorFlow, Keras, PyTorch, PyTorch Lightning, Pandas, GeoPandas, Scikit-Learn, SciPy, NumPy, Matplotlib
  3. **Computer Vision**: OpenCV, Scikit-Image
  4. **MLOps & Infrastructure**: Docker
  5. **APIs & Services**: Flask, Django
  6. **Optimization**: JuMP, Google OR-Tools

EDUCATION

PhD in Computer Science

Federal University of Rio Grande do Sul (UFRGS)

Aug 2015 – Jul 2019 | Porto Alegre, Brazil

- **AI Ethics**: On Quantifying and Understanding the Role of Ethics in AI Research (GCAI 2018), Assessing Gender Bias in Machine Translation (NCA 2020)
- **Graph Deep Learning & Combinatorial Optimization**: Learning to Solve NP-Complete Problems (AAAI 2019), Graph neural networks meet neural-symbolic computing (IJCAI 2021)