Bruno BARUFFALDI

C++/Python/Pytorch
baruffaldibruno@gmail.com

Senior Machine Learning Engineer

github.com/barufa
linkedin.com/in/brunobaruffaldi

WORKING EXPERIENCE

Senior Machine Learning Specialist at DeepAgro   **08/2024 – Currently**

DeepAgro is a startup developing a device for selective herbicide spraying using AI, computer vision and deep learning on the edge. Served as the first employee, playing a crucial role in the company's early stages.

- Mentored and collaborated with junior engineers, promoting knowledge sharing and professional growth within the team.
- Engineered an instance image retrieval system using self-supervised learning techniques, enabling cost-efficient visual similarity searches in large-scale image databases.
- Researched and evaluated state-of-the-art machine learning architectures, assessing both technical feasibility and compliance with software licensing requirements for integration into the company's core products.

Semi Senior Machine Learning Engineer at DeepAgro   **04/2021 – 08/2024**

- Led the research and development of a AI-powered, real-time weed detection system for fallow land using RGB cameras, resulting in over 90% detection accuracy and driving a 73% cost savings in agrochemical applications.
- Executed end-to-end data science projects for both internal stakeholders and external customers, involving data preprocessing, labeling, feature engineering, model training, and deployment.
- Designed a project template enabling experiment traceability, facilitating result audits and supporting MLOps workflows.

Semi Senior Software Engineer at DeepAgro   **02/2020 – 04/2021**

- Optimized and deployed C++/TensorRT deep learning models on Nvidia Jetson IOT devices, enabling more than 30 FPS real-time image inference in fully offline embedded systems.
- Architected and coded a serverless model-serving platform on AWS Cloud, making ML models accessible across the organization and enabling cost-efficient inference on millions of images.
- Established a self-hosted continuous integration (CI/CD) pipeline on in-house ARM devices.

Google Summer of Code Mentor   **02/2020 - 09/2020**

Led code reviews and mentored new students, facilitating a positive learning experience. Provided guidance through documentation, training, code examples, and feedback to support timely project completion and integration into Xapian's Open Source community.

Junior Software Engineer at Xapian   **02/2019 – 10/2019**

Xapian is an open-source search engine library that enables advanced text indexing and search capabilities for custom applications.

- Integrated six different libraries to support data extraction from diverse file formats, adding functionality for efficient indexing and search operations.
- Applied multi-threading techniques and resource constraints to isolate library bugs in subprocesses, improving the stability and resilience of the data-extraction process.

EDUCATION

Master's Degree in Computer Science   **2015 - 2023**
National University of Rosario   *GPA 9.06/10*

PROJECT EXPERIENCE

Tiger Compiler   **08/2018 – 12/2020**
Compiler development for the Tiger programming language using OCaml.

- Coded a complete Tiger compiler for x86_64 architecture, including optimizations for improved performance.
- Engineered advanced features of the Tiger language, such as nested functions and recursive data structures.

TriviaSolver   **12/2018 – 03/2019**
A question answering system focused on solving trivia questions from games such as HQTrivia or InGame in real time.

- Built web scrapers to extract and process unstructured data from SERPs across four different search engines.
- Applied basic natural language processing (NLP) techniques to clean raw web information, achieving 86% of correct answers.

GPU-Quicksort   **08/2018 - 11/2018**
Implemented Parallel Quicksort algorithm based on the approach described in an academic paper.

- Developed a high-performance GPU-Quicksort algorithm in CUDA, OpenMP, and C, achieving a 13x speedup over CPU implementations on an NVIDIA Tesla K40.

SKILLS

TECHNOLOGIES

Senior (+5 years):	C/C++, Python, OpenCV, Linux, Git, Shell
Semi Senior (~3 year):	AWS, Docker, Pytorch, TensorRT, Scikit-Learn
Junior (~1 year):	Haskell, Go, SQL, CUDA, R, ONNX Runtime

PUBLICATIONS

RGB image segmentation for selective spraying on fallow land. In *XII Congreso de AgroInformatica (CAI 2020)-JAIIO 49*