Diogo Silva

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Dear Recruiter,

If I'd describe myself in a single phrase, it would be: I was made to build things. I enjoy making things, specially if they're useful, if they add value to someone's life, if they're of service. My weapon of choice is computer programs. That's what I wanted to do since I was about 8. And that's what I've been doing for the last 15 years, first in school and, afterwards, professionally, not to mention personally. Python has been with me for the last 10 years. I've used it to develop robots, machine learning and artificial intelligence models, servers, web scrapers and more. I've also used C, C++, Java, Matlab, Javascript and, more recently, Elm. More important than specific tools is the appreciation for the fine art of problem solving. Later, I started teaching C programming to first year university students, where I share my passion and my vision of what problem solving using computers is about.

For the last 5 years, my development has been focused mostly on backend support systems for our UAV architecture in the Air Force Academy's Research and Development Center, under the umbrella of international and national research initiatives, like SUNNY, TROANTE and FIREFRONT. Still, I've also dabbled with full stack endeavors, building, among other things, a backend system capable of receiving video and data streams from a network of multiple UAVs and feeding an authenticated users in the frontend with the authorized feeds. I've migrated a legacy C++ codebase and extended it to Python. I've even had to spoof our own (ill documented) systems to reverse engineer their protocols. Whatever the problem, I dive in, no matter the stack level - I will strace myself to a solution, if need be.

I'm used to own what I build. If it breaks, I fix it. If it's hard to maintain, I feel the pain. It's not someone downstream who gets to deal with the consequences of design or implementation flaws. That has taught me important lessons: thinking in systems, architecture design, documentation, testing, reproducibility and environment isolation, to name a few. All of these go well beyond the realm of computers, but here, they're paramount. More importantly, it has taught me the need to always be learning and always be eager to share what I've learned. Making something is an unending process. Continuous improvement is the key.

Sincerely,

Diogo Silva

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Lisbon, Portugal

EXPERIENCE - Air Force Academy

- **Software Engineer, 2016 onwards**
  - Replaced a legacy C++ library with a Python equivalent, accelerating implementation of new features, used in multiple national and international projects (e.g. sunnyproject.eu, firefront.pt, PERSEUS).
  - Developed service to centralize and display data from distributed UAVs, running ROS environments. Used Nginx, Python & Flask for the central server; FFmpeg for dealing with video; added authentication and granular authorization for each resource (telemetry, video feeds); display was implemented as a web front-end (JS, jQuery, HTML, CSS, Bootstrap).
  - Lead software development on all projects since 2016: tooling for UAV operation and testing (onboard computers and fullstack systems on the ground), video and data distribution, data analysis, communication with internal and external partners (national and international).
- **Teacher, Fall 2016 onwards**
  - Taught C programming to over 60 first year engineering students, for over 5 years.
  - 2017 - Supervised master's dissertation work on implementation (Python, OpenCV) of HUD display to aid in UAV manual landing.
- **Soft skills roles**
  - Leadership instructor since 2016.
  - Managed and coached over 100 students in day to day operations since 2018.

SKILLS

- **Languages**
  Python (2013 onwards), C, Javascript (front-end, 2016 onwards), Elm (front-end, personal projects only, 2021), HTML, SQL (basic knowledge), NoSQL (personal projects with Firestore and MongoDB).
- **Tools & Frameworks**
  Docker, Flask (Python, web server, REST, websocket), ROS (Python, C++), Scikit-Learn (Python & ML), Keras / Tensorflow (Python NN), NumPy and Pandas (Python), OpenCV.

EDUCATION

- **Self Driving Car Engineer Nanodegree**
  2018, Udacity
  A 9 month long, project driven course covering computer vision, neural networks, sensor fusion, navigation, among other topics, culminating with international teamwork on a software stack deployed to a real vehicle that drove on a test track.
- **MSc. Electrical and Computer Engineering**
  2015, Prt Air Force Academy & Instituto Superior Técnico
  Dissertation Using Python, NumPy and a JIT compiler framework to accelerate computation, I implemented K-Means and Boruvka's algorithms for the GPU, and created a library that allowed Evidence Accumulation Clustering algorithm to run efficiently in large datasets (over 20GB). Worked with larger than memory datasets.

AWARDS & RECOGNITION

- **Prt Air Force Academy**
  - Best Electrical Engineering student (2012, OGMA, Portuguese Aeronautic Industry Award)
  - Honor Award for Out-standing Academic Excellence (2016, Armed Forces Communications and Electronics Association)
- **Instituto Superior Técnico**
  - Diploma for Academic Merit (2015, IST)
  - Diploma for Academic Excellence (2016, IST)

PUBLICATIONS

- D. Silva, H. Aidos, and A. Fred, "Efficient evidence accumulation clustering for large datasets", in Proceedings of the 5th International Conference on Pattern Recognition Applications and Methods - Volume 1: ICPRAM,, pp. 367–374, 2016.