

PEDRO SILVESTRE

Research Engineer - Web Information Systems - Delft University of Technology

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EDUCATION

Exchange Semester

February 2019 - July 2019

Delft University of Technology, Delft

Grade Average: 9/10

Faculty of Electrical Engineering, Mathematics & Computer Science

Notable Project: (Web-scale Data Management) Implemented an indefinitely scalable web service in Akka using a microservices architecture. Event sourcing was used for fault-tolerance. Distributed transactions performed through an original implementation of SAGAs. Dynamic scaling was achieved using AWS Load Balancers and Auto-Scaling Groups. *Project Grade:* 9.5/10

MSc in Computer Science

September 2018 - Present

NOVA School of Science and Engineering, Lisbon

Projected Grade Average: 18/20

Department of Informatics

Thesis: “Consistent High-Availability in Streaming Computations through Causal Logging”

Notable Project: (Concurrency and Parallelism) Developed and evaluated a C library providing work-efficient implementations of common parallel programming patterns using Cilk. Devised a variation of the Blelloch scan which accepts any input size. *Project Grade:* 19/20

BSc in Computer Science

September 2015 - July 2018

NOVA School of Science and Engineering, Lisbon

Grade Average: 17/20

Department of Informatics

Notable Project: (Distributed Systems) Built an HDFS clone with Namenodes and Datanodes. Automated ring replication was used for fault-tolerance. Service discovery through Kafka or multicast. A simple Map-Reduce engine was also built on top. *Project Grade:* 20/20

RESEARCH EXPERIENCE

Research Engineer

June 2019 - Present

Delft University of Technology, Delft

Advisor: Asterios Katsifodimos

- Participated in the design and development of a serverless platform leveraging stream processing systems as execution engines. Built tooling for the authoring and deployment of stateful functions.
- Developed automated distributed benchmarking infrastructure for stream processing systems leveraging Kubernetes for deployment. Allows for submitting a queue of test configurations to evaluate.
- Aided in modifying Apache Flink in order to add high availability through passive replication.
- **“Clonos: Local Recovery and High Availability for Stream Processing through Causal Logging”**

P. Silvestre, M. Fragkoulis, A. Katsifodimos

To be submitted to SIGMOD 2021

Research Assistant

September 2018 - December 2018

NOVA-LINCS, Portugal

Advisor: João Leitão

- Implemented a middleware layer providing transparent δ -CRDT based state synchronization for wireless AdHoc sensor networks in C. A reliable message fragmentation protocol was also added.

HONORS AND AWARDS

Winner of the HackDelft 2019 Hackathon (40 teams)

Built an early warning system for dutch railroads which processed time series sensor data in real time to produce warnings in a web page, including visualisations comparing normal and abnormal readings.

Awarded 1st prize in CLC Merit Scholarship (5000€)

Awarded the “CM Azambuja” Merit Scholarship (1000€) x4

PROFESSIONAL EXPERIENCE

XPandIT

July 2018 - September 2018

Big Data Software Engineering Internship

- Full-stack development of a web application for managing Docker containers for data-science workloads, integrating with Kerberos for single sign-on into containers. Containers were automatically built from a web form describing the tools and resources the container should have.

Feedzai

March 2018 - July 2018

(Academic) Software Engineering Internship

Grade: 19/20

- Designed and deployed a Continuous Integration solution with dynamic executor provisioning on an on-premises Kubernetes cluster, improving resource usage. Elasticity was achieved by monitoring the cluster state and provisioning AWS EC2 instances.
- Work was presented to hundreds of people during internal talks.

TECHNOLOGIES

Programming Languages:

Java, Python, C, Bash, Scala, Rust, C++

DevOps:

Unix, Docker, Kubernetes, Jenkins, AWS

Data-Intensive Systems:

Flink, Kafka, Spark, Hadoop, Akka, Orleans

High-Performance Computing:

Cilk, Intel TBB, MPI

Data Vizualization & Machine Learning:

Matplotlib, Pandas, Numpy, PyTorch

Full-Stack:

Spring, Angular, Flask

PROJECTS

Personal Blog: Developed a personal blog using the Spring and Angular frameworks which allows users to enter posts in \LaTeX and have them compiled to HTML pages.

Raspberry Pi Cluster: Assembled a 3 node cluster with compact power and network delivery. Runs Kubernetes on top of which services are deployed, such as Jenkins CI and the aforementioned blog.

OTHER HIGHLIGHTS

Volunteering and presenting at Flink Forward 2019: Helped setup the rooms, guide attendants and prepare speakers. Answered questions on sFaaS.

Object Oriented Programming Tutoring: For a semester, tutored two undergraduate students in object oriented programming. Lectured the material and provided guidance in projects.

Student Worker: For a year, managed my time between working and studying, in different countries, while maintaining good performance in both.

LANGUAGES

Portuguese

Native Proficiency

English

Full Professional Proficiency (CEFR level C1)

Spanish

Limited Working Proficiency

References - available on request