Alejandro Velasco Dimate

PHD(C) - SOFTWARE ENGINEERING AND DEEP LEARNING

Details

Williamsburg
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Links

Website

LinkedIn

Github

Github

Skills

Python

PyTorch

TensorFlow

Java

Spring Boot

SQL

Docker

Redis

AKKA

Languages

English

Spanish

Portuguese

Profile

PhD Candidate in Computer Science with a research interest in Deep Learning for Software Engineering, Large Language Models, and Machine Learning Interpretability. Highly adaptable and skilled in building Machine Learning Models, Microservices, and Reactive Applications. Seeking an internship to apply my research expertise and technical skills to innovative projects within a dynamic team environment.

Employment History

Research Asssistant, William and Mary, Williamsburg

JUNE 2024

Working in SEMERU research lab, under the mentorship of Dr. Denys Poshyvanyk

Research Interests:

- Deep Learning for Software Engineering
- Large Language Models
- Generative AI
- Interpretability and Explainability

Key words: DL4SE, Generative AI, LLM, SE, Interpretability, Causal Inference, Deep Learning.

Graduate Fellow, Computing Research Association - CRA-E

JUNE 2023

Responsibilities:

- Managing the research highlights series in SPARC
- Contributing to CRA-E's social media
- Providing undergraduate/graduate students perspective for materials on the CRA-E website

Teaching Assistant, William and Mary, Williamsburg, VA

AUGUST 2022 — JUNE 2024

Undergraduate courses:

- Software Engineering
- Programming for Data Science
- Applied Cybersecurity

Technical Leader, MercadoLibre, Bogota

JULY 2021 — AUGUST 2022

CPFR - First Party, Marketplace
Collaborative Planning, Forecasting and Replenishment

Responsibilities

- Support interoperability with Machine Learning Models to ensure the Forecasting and Replenishment of MercadoLibre products in the Marketplace.
- Design, Implement and Test Micro-Services in software products of MercadoLibre.
- Artifacts deployment support in development, test and production environments.
- Actively participate in team sessions (requirement analysis, architecture reviews, services design, planning)

- Elaborate documentation including design and operational support documents.

Key words: Java, Go, Spring Boot, GCP, AWS, Fury, Docker, Kafka, No-SQL, Webflux

Sr Advanced Software Development Engineer, ScotiaBank Colpatria, Bogotá

DECEMBER 2020 — JULY 2021

Responsibilities

- Design, implement and test Full-Stack applications for software products of ScotiaBank - Colpatria.
- Design, implement and test authentication and authorization micro-services in software products of ScotiaBank - Colpatria.
- Artifacts deployment support in development, test and production environments.
- Actively participate in team sessions (requirement analysis, architecture reviews, services design, planning)
- Elaborate documentation including design and operational support documents.

Key words: Java, Spring Boot, AKKA, Docker, Angular, React, Git.

Sr Software Development Engineer, ScotiaBank Colpatria, Bogotá

DECEMBER 2018 — DECEMBER 2020

Responsibilities

- Design, implement and test authentication and authorization micro-services in software products of Scotiabank - colpatria.
- Artifacts deployment support in development, test and production environments.
- Actively participate in team sessions (requirement analysis, architecture reviews, services design, planning)
- Elaborate documentation including design and operational support documents.

Key words: Java, Spring Boot, AKKA, Docker, Angular, React, Git.

Lecturer, Universidad Nacional de Colombia, Bogotá

JANUARY 2018 — AUGUST 2019

Software Engineering II

Course Goals

- Distinguish clearly between software processes based on classic models and agile methods.
- Understand fundamentals of Web development and Cloud solutions.
- Apply and Reinforce teamwork abilities and agile frameworks.
- Create a Web application with Back-end and a Front-end components

Key words: React, JavaScript, Ruby on Rails, Git, Cloud Solutions, Agile Development.

Lecturer, Universidad Nacional de Colombia, Bogotá

AUGUST 2018 — DECEMBER 2018

Data Structures

Course Goal

- Understand main Data-Structure concepts and ADTs.
- Implement Data-Structures and algorithms using Java as programming language.
- Solve problems using Data-Structures.

Key words: Data Structures, Algorithms, Java.

Lead Software Development Engineer (Full Stack), HighTech Software, Bogotá

NOVEMBER 2017 — DECEMBER 2018

Responsibilities

- Design and implement distributed services and applications in Fin-tech software products.
- Support the deployment of artifacts in development, test and production environments.
- Actively participate in team sessions (requirement analysis, architecture reviews, services design, planning) .
- Elaborate documentation including design and operational support documents.
- Support team members in software development of task during sprint.

Java, Angular, JavaScript, REST, SOAP.

Lecturer, Universidad Nacional de Colombia, Bogotá

JULY 2016 — DECEMBER 2017

Object Oriented Programming

Course Goals.

- Understand and apply fundamental principles of object-oriented programming.
- Solve programming problems using the OOP paradigm, and SOLID principles.
- Write programs in Java using IDEs features to edit, compile, test, debug and deploy.
- Build medium-sized standalone applications, working as members of small teams.

Object Oriented Programming, SOLID, Java, Team Development.

Software Developer, MyCreateam, Bogotá

JANUARY 2016 — JUNE 2016

Responsibilities

- Develop back-end applications and mobile MVPs.
- Actively participate in team sessions (requirement analysis, architecture reviews, services design, planning).

Key words: Java, Angular, Rails, Python.

Software Developer, Liminal, Bogotá

MARCH 2016 — JULY 2017

Responsibilities

- Design, implement and test monolithic applications in software products.
- Elaborate documentation including design and operational support documents.

Key words: Java, PostgreSQL, REST, SOAP, Angular, JavaScript

Teaching Assistant, Universidad Nacional de Colombia

FEBRUARY 2015 — NOVEMBER 2015

Data Structures Course.

Teaching Assistant, Universidad Nacional de Colombia, Bogotá

JUNE 2015 — AUGUST 2015

Software Evolution and Maintenance

Software Developer, Universidad Nacional de Colombia - Direccion Nacional de Admisiones, Bogotá

JUNE 2014 — DECEMBER 2014

Responsibilities

- Redesign and Implement the web page of the Direccion Nacional de Admisiones
- Update the site architecture and keep safe the information.
- Document all the work.

Key words: Java, JavaScript, HTML.

Teaching Assistant, Universidad Nacional de Colombia, Bogotá

FEBRUARY 2014 — NOVEMBER 2014

Object Oriented Programming Course.

Education

(BSc) Ingeniería de Sistemas y Computación, Universidad Nacional de Colombia, Bogotá

JANUARY 2011 — DECEMBER 2015

(MSc) Magister en Ingenieria de Sistemas y Computación, Universidad Nacional de Colombia, Bogotá

FEBRUARY 2016 — AUGUST 2019

PhD(c), College of William and Mary

AUGUST 2022

Extra-curricular activities

Researcher, Universidad Nacional de Colombia, Bogotá

JANUARY 2013 — DECEMBER 2019

COLSWE - Colectivo de Investigacion en Ingenieria de Software

Researcher , William and Mary

AUGUST 2022

SEMERU - Software Engineering Maintenance and Evolution Research Unit

Publications

Toward Neurosymbolic Program Comprehension

FEBRUARY 2025

A. Velasco, A. Garryyeva, D. N. Palacio, A. Mastropaolo, and D. Poshyvanyk, “Toward Neurosymbolic Program Comprehension,” Feb. 03, 2025, *arXiv*: arXiv:2502.01806. doi: 10.48550/arXiv.2502.01806.

SnipGen: A Mining Repository Framework for Evaluating LLMs for Code,

FEBRUARY 2025

D. Rodriguez-Cardenas, A. Velasco, and D. Poshyvany, “SnipGen: A Mining Repository Framework for Evaluating LLMs for Code,” Feb. 10, 2025, arXiv: arXiv:2502.07046. doi: 10.48550/arXiv.2502.07046.

How Propense Are Large Language Models at Producing Code Smells? A Benchmarking Study

JANUARY 2025

A. Velasco, D. Rodriguez-Cardenas, L. R. Alif, D. N. Palacio, and D. Poshyvanyk, “How Propense Are Large Language Models at Producing Code Smells? A Benchmarking Study,” Jan. 18, 2025, arXiv: arXiv:2412.18989. doi: 10.48550/arXiv.2412.18989.

Towards More Trustworthy and Interpretable LLMs for Code through Syntax-Grounded Explanations

JULY 2024

D. N. Palacio, D. Rodriguez-Cardenas, A. Velasco, D. Khati, K. Moran, and D. Poshyvanyk, “Towards More Trustworthy and Interpretable LLMs for Code through Syntax-Grounded Explanations,” Jul. 12, 2024, arXiv: arXiv:2407.08983. doi: 10.48550/arXiv.2407.08983.

Measuring Emergent Capabilities of LLMs for Software Engineering: How Far Are We?

NOVEMBER 2024

C. O’Brien, D. Rodriguez-Cardenas, A. Velasco, D. N. Palacio, and D. Poshyvanyk, “Measuring Emergent Capabilities of LLMs for Software Engineering: How Far Are We?,” Nov. 26, 2024, *arXiv*: arXiv:2411.17927. doi: 10.48550/arXiv.2411.17927.

Which Syntactic Capabilities Are Statistically Learned by Masked Language Models for Code?

MAY 2024

A. Velasco, D. N. Palacio, D. Rodriguez-Cardenas, and D. Poshyvanyk, “Which Syntactic Capabilities Are Statistically Learned by Masked Language Models for Code?,” in Proceedings of the 2024 ACM/IEEE 44th International Conference on Software Engineering: New Ideas and Emerging Results, Apr. 2024, pp. 72–76. doi: 10.1145/3639476.3639768.

Toward a Theory of Causation for Interpreting Neural Code Models

MAY 2024

D. N. Palacio, A. Velasco, N. Cooper, A. Rodriguez, K. Moran, and D. Poshyvanyk, “Toward a Theory of Causation for Interpreting Neural Code Models,” IIEEE Trans. Software Eng., vol. 50, no. 5, pp. 1215–1243, May 2024, doi: 10.1109/TSE.2024.3379943.

Evaluating and Explaining Large Language Models for Code Using Syntactic Structures

AUGUST 2023

D. N. Palacio, A. Velasco, D. Rodriguez-Cardenas, K. Moran, and D. Poshyvanyk, “Evaluating and Explaining Large Language Models for Code Using Syntactic Structures,” Aug. 07, 2023, *arXiv*: arXiv:2308.03873. doi: 10.48550/arXiv.2308.03873.

Applying Machine Learning with Chaos Engineering

OCTOBER 2020

Oct 18, 2020 publication description2020 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)

J. Hernández-Serrato, A. Velasco, Y. Niño, M. Linares-Vásquez, “Applying Machine Learning with Chaos Engineering,” in Proceedings of the 2020 IEEE International Symposium on Software Reliability Engineering WorJ. Hernández-Serrato, A. Velasco, Y. Niño, M. Linares-Vásquez, “Applying Machine Learning with Chaos Engineering,” in Proceedings of the 2020 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW), October 2020, pp. 151 -152, doi: 10.1109/ISSREW51248.2020.00057kshops (ISSREW), October 2020, pp. 151 -152, doi: 10.1109/ISSREW51248.2020.00057

Automated Fine Grained Traceability Links Recovery between High Level Requirements and Source Code Implementations

AUGUST 2020

VelascoA. and AponteJ., “Automated Fine Grained Traceability Links Recovery between High Level Requirements and Source Code Implementations”, *paradigmplus*, vol. 1, no. 2, pp. 18-41, Aug. 2020.

https://journals.itiud.org/index.php/paradigmplus/article/view/12

Recovering Fine Grained Traceability Links between Software Mandatory Constraints and Source Code

2019

Velasco A., Aponte Melo J.H. (2019) Recovering Fine Grained Traceability Links Between Software Mandatory Constraints and Source Code. In: Florez H., Leon M., Diaz-Nafria J., Belli S. (eds) Applied Informatics. ICAI 2019. Communications in Computer and Information Science, vol 1051. Springer, Cham.

https://link.springer.com/chapter/10.1007/978-3-030-32475-9_37

Evolving a Project-based Software Engineering Course: A Case Study

2017

D. Delgado, A. Velasco, J. Aponte and A. Marcus, "Evolving a Project-Based Software Engineering Course: A Case Study," *2017 IEEE 30th Conference on Software Engineering Education and Training (CSEE&T)*, Savannah, GA, 2017, pp. 77-86.

https://ieeexplore.ieee.org/document/8166686

References

Denys Poshyvanyk from William & Mary
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