David N.Palacio

PhD Candidate in Computer Science

about

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in
mobile
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languages
spanish/german

research interests

source code generation with deep learning (DL), natural language processing (NLP) in software automation, deep learning for software engineering interpretability, applied causal inference

summary

Ph.D. Candidate in Computer Science with five years of experience as a Software Researcher, including two years in refactoring automation with generic algorithms; improving the effectiveness of traceability link recovery using Information Retrieval (IR) and Deep Learning (DL); deep generative coding and representation. Three years of experience as a Software Engineer working on the back-end; including one year in a start-up implementing a customizable marketplace that reduces development cost by 45% employing reactive programming and cloud services; led the migration and re-architecture of a fiduciary core system used by the biggest banks in Colombia and the Dominican Republic. Seeking an internship position in Machine Learning (ML) or Data Science for automating/analyzing software construction and maintenance.

education

2017–2018 **Ph.D. Student Computer Science** William & Mary, Williamsburg,VA [GPA:3.75]

- **Coursework**: Data Analysis and Simulation, Advance Software Engineering

2012-2016 **M.Sc. Computer Engineering** National University of Colombia (UNAL), Bogotá [GPA:3.85]

- (2015) *Assistantship*: Head TA for Computer Programming Courses at UNAL
- (2014) *Indian Government Scholarship ITEC* for Specialized Training on Desing and Implementation of E-Learning Courses at C-DAC, India
- (2012-2013) *Exchange program for students from the top 1%* at Technische Universitat München, Germany
- **Coursework**: Intelligent Systems, Machine Learning

2007–2011 **B.Sc. Computer Engineering** National University of Colombia (UNAL), Bogotá [GPA:3.7]

- **Coursework**: Software Engineering, Evolutionary Computation, and Data Mining

research experience

2017-Present **William & Mary, Williamsburg** As Software Researcher and Phd Candidate in SEMERU Research group

- Using a T5 model to support four code-related task: automatic bug-fixing, generation of assert statements in test methods, code summarization, and injection of code mutants [ICSE'21]
- Proposed a research road-map that delineates the foundations of DL techniques applied to SE research by analyzing the components of learning. Note: This survey is under revision by a Journal [ArXiv'20]
- Implemented a probabilistic approach to improve the effectiveness of traceability links by around 10% [ICSE'20]
- Learning to Identify Security-Related Issues Using Convolutional Neural Networks achieving a 96% success rate [ICSME'19]

2015–2016 **National University of Colombia, Bogotá** As Master Student in ALIFE Research group

- A computational solution for the software refactoring problem based on a hybrid adaptive evolutionary algorithm achieving better time complexity and feasible refactoring recommendations [GECCO'18]

programming

Python, Scala, Java, C++, Pl/SQL, NoSQL

machine learning

Tensorflow, fastAI, RapidMiner, Spark

work experience

2020 **Ph.D. Intern** USA

- (05-08 2020) *CISCO, RTP*:
  - Designed and implemented a data science pipeline using information theory to interpret ML methods in software traceability

2013-2016 **Senior Software Developer / Team Leader in Software Research** Colombia

- (02-12 2016) *KSMTI, Bogotá*:
  - Designed and implemented software architectures for automatic deployment of marketplaces that reduces clients costs by 45%
- (03-12 2015) *SED Ministry of Education, Bogotá*:
  - Maintained and implemented the software architecture of the academic registration system for all public high-school institutions in Bogota
  - Led the adoption of software practices in the government institution by optimizing 65% of the development process and information systems
- (2013-2014) *ITC Consultores SAS, Bogotá*:
  - Led the research team of 7 computer engineers and programmers to enhance software practices in the company achieving Level 4 according to the CMMI diagnosis
  - Engineered the required architecture for a technology migration that impacts the core system estimated to help client productivity by 40%

2012-2013 **Software Developer** Colombia & Germany

- (2013) *Allianz AMOS SE, Munich*:
  - Software Testing Internship for the Allianz Virtual Client Quality Assurance project
  - Created automatic testing script to integrate functional and non-functional results for virtualized environments; reduced testing time by 8% on the releases
- (2012) *ITC Consultores SAS, Bogotá*:
  - Built a critical pl/sql back-end module for portfolio operations of the biggest banks in Colombia
  - Refactor major components augmenting comprehensibility of the system by 60%

projects

2017-2018 **Traceability Link Recovery** Semeru Research Group & Cisco Systems, Williamsburg

- Deep Learning and Information Retrieval techniques to recover trace links among artifacts by prioritizing the secure development life-cycle [project link]
- Employed technology: Python, TensorFlow, Keras, and PyMC3

2016 **Markreator** KSMTI, Bogotá

- Automated deployment of marketplaces tailored for any type of business; allow users to define their own requirements and automatically generate a stable version of the app [project link]
- Employed technology: akka streams, scala, java, elastic search, aws, dynamodb

2014 **Software Technology Migration** ITC Consultores SAS, Bogotá

- Re-design of a fiduciary app that demands a technology migration to inter-operate with other financial systems. The solution required an automatic migration of oracle forms components into web-oriented components [company link]
- Employed technology: Oracle Forms, Pl/SQL, Java