Arthur Selle Jacobs

Resumé

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⌂ *https://asjacobs92.github.io/*
Brazilian, born on 10/Sep/1992.

Education

Aug 2017 – Oct 2022	**Federal University of Rio Grande do Sul**, *PhD in Computer Science*, Brazil.
Sep 2019 – Jul 2020	**Princeton University**, *Visiting Student Research Collaborator*, US.
Mar 2011 – Dec 2016	**Federal University of Rio Grande do Sul**, *BSc in Computer Science*, Brazil.
Jan 2014 – Dec 2014	**University of Maryland**, *Study Abroad, Brazil Scientific Mobility Program*, US.

Awards & Recognition

2020 **IBM PhD Fellowship Award**.
  o For academic excellence and expertise in pioneering research areas, including artificial intelligence, data science, and security.

Employment History

Jun 2020 – Current **Fuerza Studio**, *Fullstack Developer*, Remote.
  o Developed Web platform for client company to create, manage and deploy ads at scale, across multiple platforms, and automatic generation of brand-specific ads.
  o Frontend applications were developed using ReactJS, while the Backend was developed using Node.js and PHP, relying on ElasticSearch, MongoDB and S3 for storage. Also developed a Serverless layer, deployed using AWS Lambda, responsible for video and image processing.
  o The ads rendering engine was developed using predefined templates and the FFMPEG library to stitch together brand and product-specific videos. Videos were selected from a library of existing snippets through a recommendation engine that leveraged ML-generated and human-provided tags, using NLP to find the closest matches.

Jan 2018 – May 2020 **Sporty App**, *Fullstack Developer*, Remote.
  o Developed web application to allow sports clubs to manage court reservations and memberships, and users to reserve courts online. Product built using AngularJS, Node.js, Firebase and MongoDB.

May 2018 – Sep 2019 **Brazilian Computer Society**, *Project Manager*, Porto Alegre, RS – Brazil.
  o Acted as Project Manager of a 6-person development team, coordinating the development of a Journal and Events Management System (JEMS), with support for peer-reviewing submissions. Designed the system architecture using Django Rest Framework and Angular 7.

May 2015 – Sep 2017 **ADP, LLC.**, *Software Developer*, Porto Alegre, RS – Brazil.
  o Developed Java application to deploy ADP's database information for the government project eSocial, using Spring and SOAP web services. Acted as Software Architect for other scrum teams, both in Brazil and Chile.

Research Experience

Aug 2017 – Oct 2022 **Networks Lab, Federal University of Rio Grande do Sul**, *Doctoral Researcher*, Porto Alegre, RS – Brazil.

- Worked under the supervision of Prof. Lisandro Z. Granville and Prof. Ronaldo A. Ferreira, researching network management topics, including Machine Learning applied to networking and Intent-based networking.

- Researched the credibility of Machine Learning models applied to networking problems, and network security in particular, using a novel eXplainable Artificial Intelligence (XAI) technique to extract decision tree global explanations from black-box models, called Trustee.

- Designed and implemented a refinement method for network intents expressed in natural language, enabling operators to deploy network configurations using a conversational interface, called Lumi.

- Collaborated with researchers from many institutions and countries, which gave me the opportunity to work on a variety of topics and resulted in several publications.

Sep 2019 – Jul 2020 **Systems Lab, Princeton University**, *Doctoral Researcher*, Princeton, NJ – US.

- Worked under the supervision of Prof. Jennifer Rexford and Dr. Walter Willinger, from NIKSUN Inc., researching network profiling techniques and traffic behavior models in programmable data plane networks, using the P4 language. Also examined existing XAI tools and techniques to interpret black-box models applied to network and security.

- Developed Proof-of-concept application for NIKSUN Inc. that applies Natural Language Processing techniques to querying performance and security related reports. Integrated PoC into existing NIKSUN's product.

Selected Publications

- **A. S. Jacobs**, R. Beltiukov, W. Willinger, R. A. Ferreira, A. Gupta, L. Z. Granville, "AI/ML and Network Security: The Emperor has no Clothes", In *2022 ACM Conference on Computer and Communications Security (ACM CCS 2022)*, To appear, Los Angeles (2022).

- **A. S. Jacobs**, R. J. Pfitscher, R. H. Ribeiro, R. A. Ferreira, L. Z. Granville, W. Willinger, S. G. Rao, "Hey, Lumi! Using Natural Language for Intent-Based Network Management", In *2021 USENIX Annual Technical Conference (USENIX ATC 21)*, pages 625–639, Virtual Conference (2021).

- **A. S. Jacobs**, R. J. Pfitscher, R. A. Ferreira and L. Z. Granville, "Refining Network Intents for Self-driving Networks", In *ACM SIGCOMM Computer Communication Review*, Volume 48 Issue 5, pages 55 - 63 (2018).

- **A. S. Jacobs**, R. J. Pfitscher, R. H. Ribeiro, R. A. Ferreira, L. Z. Granville, S. G. Rao, "Deploying Natural Language Intents with Lumi", In *ACM SIGCOMM 2019 Conference Posters and Demos*, pages 82-84, Beijing, China (2019).

- **A. S. Jacobs**, R. J. Pfitscher, R. A. Ferreira, L. Z. Granville, "Refining Network Intents for Self-driving Networks", In *ACM SIGCOMM 2018 Workshop on Self-Driving Networks (SelfDN 2018)*, pages 15-21, Budapest, Hungary (2018).

Technical skills

- **Programming Languages:** JavaScript, Python, Java, C#, C++, C and Progress 4GL.

- **Tools, Frameworks and Technologies:** Spring and Django; Node.js, React, Angular and Vue; Ionic; Gitlab CI, Github CI, Jenkins, and AWS;

- **Machine Learning and NLP:** Scikit-learn, Tensorflow, Keras, PyTorch; Dialogflow, SpacyNLP and RasaNLP.

- **Databases:** Firebase, MongoDB, S3, ElasticSearch, MySQL, Oracle and Progress.

Languages

- **Portuguese:** native.
- **English:** fluent.
- **Spanish:** advanced.