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Arthur Jacobs

Curriculum Vitae

Third year PhD student in Computer Science, in the Federal University of Rio Grande do Sul, advised by Prof. Dr. Lisandro Granville, and co-advised by Prof. Dr. Ronaldo Ferreira. Currently visiting Princeton University, under the supervision of Prof. Dr. Jennifer Rexford, and working closely with Dr. Walter Willinger, from NIKSUN. Passionate about science and development, with a strong will to learn about a multitude of subjects, and to build impacting and complex projects. Research interests include network management, Network Functions Virtualization, Intent-based Networking, Natural Language Processing for network management, self-driving networks, programmable networks and artificial intelligence.

Education

Sep 2019 – Sep 2020 **Princeton University**, *Visiting Student Research Collaborator*, Princeton, NJ – US.

Aug 2017 – Jun 2021 (Expected) **Federal University of Rio Grande do Sul**, *PhD in Computer Science*, Porto Alegre, RS – Brazil.

Jan 2014 – Dec 2014 **University of Maryland**, *Study Abroad, Brazil Scientific Mobility Program*, College Park, MD – US.

Mar 2011 – Dec 2016 **Federal University of Rio Grande do Sul**, *BSc in Computer Science*, Porto Alegre, RS – Brazil.

Research Experience

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

- Worked under the supervision of Prof. Jennifer Rexford and Dr. Walter Willinger, from NIKSUN, researching network profiling techniques and traffic behavior models in programmable data plane networks, using the P4 language.

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

- Worked under the supervision of Prof. Lisandro Z. Granville, researching network management topics, such as Network Functions Virtualization and Software Defined Networking.
- Developed an affinity metric for Virtualized Network Functions, to identify and prevent performance degradations and resource contention in virtualized Service Function Chains.
- Constructed a refinement method for network intents expressed as natural language enabling operators to deploy network configurations using a conversational interface, such as Google Assistant.

Aug 2012 – May 2013 **Networks Lab, Federal University of Rio Grande do Sul**, *Undergraduate Researcher*, Porto Alegre, RS – Brazil.

- Worked under the supervision of, then, PhD student Cristiano B. Both, in a joint project with company Datacom Inc., researching on using artificial intelligence to generate alarms for network operators.
- Developed a switch monitoring web platform using Java, and the Vaadin web framework.

Aug 2011 – Aug 2012 **Networks Lab, Federal University of Rio Grande do Sul**, *Undergraduate Researcher*, Porto Alegre, RS – Brazil.

- Worked under the supervision of, then, PhD student Oscar M. Caicedo, researching on management on virtualized network using Mashup applications.
- Investigated network virtualization background and related works on the research topic.

Employment History

May 2018 – Sep 2019 **Brazilian Computer Society**, *Project Manager*, Porto Alegre, RS – Brazil.

- 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.
- Defined the architecture and technologies of the system, having the backend developed as Restful APIs, using Django Rest Framework, and the frontend developed with Angular 7.
- Coordinated the tasks of the team members, providing technical support and knowledge to aid the growth of team members and the developing process.

May 2016 – Sep 2017 **ADP, LLC.**, *Software Developer*, Porto Alegre, RS – Brazil.

- Acted as Software Architect on agile Discovery Teams, alongside a Development Leader and a Senior Product Owner, carrying out a leadership position in the development process.
- Worked with several different Scrum teams, supporting the development of designed solutions, both in Progress 4GL and Java.
- Worked closely with infrastructure teams, both in Brazil and Chile, to configure and manage execution environments of developed applications.

Sep 2015 – May 2016 **ADP, LLC.**, *Software Developer Intern*, Porto Alegre, RS – Brazil.

- Developed Java application to deploy ADP's database information for the government project eSocial, using Spring and SOAP web services.
- Developed a web portal to monitor the deployment application's health.

May 2014 – Aug 2014 **HCI Labs, University of Maryland**, *Software Developer Intern*, College Park, MD – US.

- Worked under the supervision of Prof. Mark Jacobs, in the Human-Computer Interactions labs of University of Maryland.
- Developed Android version of the iOS app, Leafsnap, to identify trees and plants based on photos of leaves.

Research Publications

Peer-Reviewed Conference Papers

- M. V. B. da Silva, **A. S. Jacobs**, R. J. Pfitscher, L. Z. Granville, "Predicting Elephant Flows in Internet Exchange Point Programmable Networks", In *2019 International Conference on Advanced Information Networking and Applications (AINA)*, pages 485–497, Matsue, Japan (2019).
- M. V. B. da Silva, **A. S. Jacobs**, R. J. Pfitscher, L. Z. Granville, "IDEAFIX: Identifying Elephant Flows in P4-Based IXP Networks", In *2018 IEEE Global Communications Conference (GLOBECOM)*, pages 1-6, Abu Dhabi, United Arab Emirates (2018).
- **A. S. Jacobs**, R. J. Pfitscher, R. L. dos Santos, M. F. Franco, E. J. Scheid and L. Z. Granville, "Artificial Neural Network Model to Predict Affinity for Virtual Network Functions", In *2018 IFIP/IEEE Network Operations and Management Symposium (NOMS)*, pages 1-9, Taipei, Taiwan (2018).
- R. J. Pfitscher, E. J. Scheid, **A. S. Jacobs**, M. F. Franco, R. L. dos Santos, A. E. Schaeffer-Filho and L. Z. Granville, "A Model for Quantifying Performance Degradation in Virtual Network Function Service Chains", In *2018 IFIP/IEEE Network Operations and Management Symposium (NOMS)*, pages 1-9, Taipei, Taiwan (2018).

- **A. S. Jacobs**, R. L. dos Santos, M. F. Franco, E. J. Scheid, R. J. Pfitscher and L. Z. Granville, "Affinity measurement for NFV-enabled networks: A criteria-based approach", In *2017 IFIP/IEEE Symposium on Integrated Network and Service Management (IM)*, pages 125-133, Lisbon, Portugal (2017).

Peer-reviewed Journal Articles

- R. J. Pfitscher, **A. S. Jacobs**, L. Zembruzki, R. L. dos Santos, E. J. Scheid, M. F. Franco, A. E. Schaeffer-Filho and L. Z. Granville, "Guiltiness: A Practical Approach for Quantifying Virtual Network Functions Performance", In *Computer Networks*, Volume 161, pages 14 - 31 (2019).
- **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).
- O. M. C. Rendon, C. R. P. dos Santos, **A. S. Jacobs** and L. Z. Granville, "Monitoring Virtual Nodes using mashups", In *Computer Networks*, Volume 64, pages 55 - 70 (2014).

Posters, Workshops and Others

- **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).
- **A. S. Jacobs**, R. L. dos Santos, M. F. Franco, E. J. Scheid, R. J. Pfitscher, L. Z. Granville, "AMNESiA: Affinity measurement platform for NFV-enabled networks", In *2017 IFIP/IEEE Symposium on Integrated Network and Service Management (IM)*, pages 899-900, Lisbon, Portugal (2017).

Technical skills

- **Programming Languages:** C, C++, C#, Java, PHP, JavaScript, HTML, CSS, Python, OCaml, Progress 4GL and SQL.
- **Tools and Frameworks:** Git, SVN and Mercurial; Hibernate and ORMLite; Maven and Gradle; Spring; Bootstrap, JQuery and Underscore; Node.js, AngularJS, Ionic and Django.
- **Databases:** Firebase, MongoDB, PostgreSQL, MySQL, Oracle and Progress.

Language skills

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

References

Lisandro Zambenedetti Granville
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