Joana M. F. da Trindade

| CONTACT INFORMATION | Joana M. F. da Trindade
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http://jmftrindade.github.io |

RESEARCH INTERESTS

Graph data management, distributed data processing systems, systems performance analysis

EDUCATION

Massachusetts Institute of Technology   Fall 2016– present
PhD in Computer Science, CGPA 5.0/5.0
Working with Prof. Sam Madden at MIT's Database Group, and Prof. Julian Shun at MIT's Theory of Computation Group.
- Graduate EECS: Database Systems, Distributed Systems, Advances in Computer Vision, Graph Analytics (audited), Introduction to the Theory of Computation
- Minor: Fund. of Music Theory, Digital Music Processing (Graduate version, Fall 2020)

University of Illinois at Urbana-Champaign   2009–2011
Master of Science in Computer Science, GPA 3.88/4.00
Advisor: Prof. Marianne Winslett
- Thesis: Supporting Dynamic Queries and Annotations Over Data Graphs
- Graduate Coursework: Advanced Database Systems, Advanced Operating Systems, Algorithms, Cloud Computing Infrastructure, Fault-Tolerant Digital Systems Design, Parallel Computer Architecture, Secure Data Management

Universidade Federal do Rio Grande do Sul   2003–2008
Bachelor of Science in Computer Science, GPA 8.0/10.0, and 9.58/10.0 (last 60 hours)
Advisors: Prof. Dr. Dieter Rombach and Dipl-Inf. Thorsten Keuler
- Final Project (in collaboration with TU Kaiserslautern): Metamodel based Architecture Evaluation of Software Systems

Technische Universitaet Kaiserslautern   2006–2007
Exchange Program, Computer Science Department
- Undergraduate research assistant at Fraunhofer IESE

AWARDS

Microsoft Research PhD Fellowship, Class of 2019.

EECS Merrill Lynch Graduate Fellowship, MIT, 2016.

Sloan Scholar, Alfred P. Sloan Foundation's MPHD Program, MIT, 2016.

10 Google Peer Bonuses, 6 Google Kudos Awards, 1 Google Spot Bonus, for technical and professional service contributions. Spot bonus awarded for internal launch of fleet-wide read / write RPC real-time latency analysis of Colossus clients and related storage servers, 2012–2015.

Siebel Scholar, Class of 2011, awarded for academic excellence and demonstrated leadership to top 5 first-year graduate students from the top 7 CS departments in the world.

Overachievement bonus at the end of internship, SAP Research - Security & Trust, France, 2008.

TEACHING &
MENTORSHIP

Teaching Assistant

- MIT: TA for *Software Systems for Data Science (6.080)*, Fall 2019

Mentoring

- MIT: Mengyuan Sun, Master of Engineering, Fall 2019 and Spring 2020

EXPERIENCE

Microsoft Research, New York, NY (remotely)   Summer 2020
Research Intern, Systems Group at MSR NYC
- Working with Dr. Sid Sen, Dr. Mihir Nanavati and Nathan Taylor at AI for Systems research group.

Microsoft, Redmond, WA   Summer 2017
Research Intern, Cloud and Information Services Lab
- Worked with Dr. Carlo Curino and Dr. Konstantinos Karanasos on query optimization for large-scale provenance graphs.
- Research paper on this work accepted at ICDE 2020; co-authored patent with Microsoft collaborators.

Google Inc, New York, NY and Mountain View, CA (2016)   2012–2016
Software Engineer, Apps and Storage Infrastructure
- 2015–2016: In charge of infrastructure and monitoring tasks on both backend and frontend components for Google Jamboard.
- 2013–2015: First NYC engineer on a Storage Infrastructure team that works to improve performance of Google's largest distributed storage systems, including Bigtable, the new version of GFS (aka Colossus), Blobstore, and Spanner. Aspects analyzed include distributed caching mechanisms, placement policies, and file read / write RPC latency distributions of different storage systems.
- 2012–2013: Integration of Gmail, Photos and Drive storage metadata (featured on TechCrunch, Google Drive Blog and many others).
- Techs: C++, MapReduce, Java, Python, JavaScript, R.

Bloomberg LP, New York, NY   2011–2012
Financial Software Developer, Real-time Data Feeds
- Part of group that is in charge of ingesting and normalizing all real-time data that stock exchanges send to Bloomberg. Developed and enhanced a number of real-time low-latency market data feed handlers for North and South American exchanges, including Toronto Stock Exchange and Cantor Fitzgerald.
- Primary and/or secondary on-call for 20+ real-time data feeds.
- Basic financial knowledge in fixed income, commodities, equities and derivatives (options and futures) asset classes.
- Techs: multithreading, distributed systems, C++, FIX/FIXML.

University of Illinois at Urbana-Champaign   2009–2011
Student and Siebel Fellow, August 2010–June 2011
- Proposed a data partitioning technique for large-scale social network distributed data, co-authoring two papers on it. This work also served as basis for 2 other MS thesis advised by Prof. Yi Lu from ECE department.
- Wrote MS thesis on graph data query provenance, based on work developed during internship at IBM T. J. Watson Research Center. Advised by Dr. Anastasios Kementsietsidis (IBM) and Prof. Marianne Winslet (Database and Information Systems Lab, UIUC).

- Supported by a Siebel Scholar Fellowship, awarded to top 5 students in the top 5 CS universities in the US.

Research Assistant, August 2009–May 2010
- Studied techniques towards secure storage and regulatory compliance at Database and Information Systems Lab and DEPEND research groups.
- Co-designed a FPGA-based trusted timestamping platform.
- Co-designed and implemented a microkernel based Android rootkit, presented at the poster session of Oakland 2010.

Visiting Scholar, DEPEND research group, January 2009–June 2010
- Performed empirical reliability analysis of virtualized systems through fuzzing of VM hypervisor (VMware ESXi and Xen) interfaces.
- Implemented a fault injection tool that uses VM introspection to corrupt virtual memory addresses and process data structures of Xen Virtual Machines.
- Keywords: C/C++, Xen, VMware ESXi, Fuzzing, Linux Kernel Module Programming

IBM Research T. J. Watson, Hawthorne, NY   Summer 2010
Research Intern
- Interned at the Unified Data Analytics group under Dr. Kavitha Srinivas, and mentored by Dr. Anastasios Kementsietsidis on provenance for large-scale heterogeneous systems.
- Designed extensions to RDF data model and SPARQL query language to support provenance annotations over graph structured data.
- Keywords: data provenance, RDF, SPARQL, graphs, query optimization

Google Inc, Porto Alegre, Brazil   Summer 2008
Student Developer, Summer of Code 2008 with Globus Alliance and NCSA
- Selected for Google Summer of Code Program 2008 with Globus Alliance. Designed and implemented SAML Holder-of-key Authentication for Single Sign-On in GridShib.
- Contributed to an OASIS specification on SAML Holder-of-Key Subject Confirmation submitted to the SSTC in August 2008, and written by Thomas R. Scavo.
- Mentioned twice as a success story at Google Open Source Blog (`http://bit.ly/7bpDyu`, `http://bit.ly/4xWd6o`).
- Keywords: Java, Identity Management, Single Sign-On, SAML, Shibboleth2, Maven, Ant

SAP Research, Mougins, France   November 2007–March 2008
Research Intern, SAP Research in Security & Trust
- Participated in the SERENITY E.U. funded project (System Engineering for Security and Dependability) at SAP Research in Security & Trust.
- Designed and implemented a "security patterns" library and brokered authentication for Web Services and Workflow SERENITY research prototypes.
- Designed and implemented an API providing support for XML-Encryption and XML-Signature of SOAP messages in SERENITY's workflow applications.
- Filed two patents as outcome of this work (see patents section).
- Keywords: Java, SSO, SAML, SOA, Web Services, WS-Security, Apache Axis2, Apache Rampart.

Fraunhofer IESE, Kaiserslautern, Germany   December 2006–October 2007
Undergraduate Research Assistant, Product Line Architectures

- Designed and implemented (i) a domain-specific language to describe architectural metrics and rules, (ii) an algorithm to extract and translate architectural facts to a knowledge base representation that can be interpreted by a Prolog engine, and (iii) an Eclipse based tool to visually aid a software architect during the process of defining architectural metrics, and to perform quantitative assessments of software architectures.
- Wrote my B.S. thesis based on this work (see education section).
- Keywords: Java, Prolog, Model-Driven Architecture, Software Architecture Metrics, Eclipse Plug-in Development, Eclipse Modeling Framework.

PATENTS

Joana M. Fonseca da Trindade (IBM Research T. J. Watson), Anastasios Kementsietsidis (IBM Research T. J. Watson) and Mudhakar Srivatsa (IBM Research T. J. Watson), US 20120327087, "Supporting Recursive Dynamic Provenance Annotations Over Data Graphs." Filed June 27, 2011.

A. Benameur (SAP Labs France), **J. Da Trindade** and P. El-Khoury (SAP Labs France), US 20100162406, "Security Aspects of SOA." Filed June 12, 2009.

A. Benameur (SAP Labs France), **J. Da Trindade** and P. El-Khoury (SAP Labs France), Europe EP2133831A1, "Security Aspects of SOA." Filed June 12, 2008.

INVITED TALKS "Kaskade: Graph Views for Efficient Graph Analytics", University of Chicago (hosted by ChiData Group), May 2020.

"Kaskade: Graph Views for Efficient Graph Analytics", ICDE 2020, April 2020.

"Kaskade: Graph Views for Efficient Graph Analytics", Microsoft (hosted by Gray Systems Lab), April 2020.

"Graph Views for Efficient Graph Analytics", Imperial College (hosted by LSDS Group), April 2018.

PUBLICATIONS **J. M. F. da Trindade**, K. Karanasos, C. Curino, S. Madden and J. Shun, "Kaskade: Graph Views for Efficient Graph Analytics." *ICDE 2020, Dallas, TX April 2020.* (To Appear)

J. M. F. da Trindade, K. Karanasos, C. Curino, S. Madden and J. Shun, "Kaskade: Graph Views for Efficient Graph Analytics." (arXiv 2019 extended pre-print).

M. Vartak, **J. M. F. da Trindade**, M. Zaharia and S. Madden, "MISTIQUE: A System to Store and Query Model Intermediates for Model Diagnosis." *SIGMOD 2018, Houston, TX, June 2018.*

A. Ilyas, **J. M. F. da Trindade**, R. C. Fernandez and S. Madden, "Extracting Syntactic Patterns from Databases." *ICDE 2018, Paris, France, April 2018.*

M. Yuan, D. Stein, B. Carrasco, **J. M. F. da Trindade** and Y. Lu, "Partitioning Social Networks for Fast Retrieval of Time-dependent Queries." *3rd International Workshop on Graph Data Management (GDM, co-located with ICDE), Washington, DC, April 2012.* **Invited paper**.

B. Carrasco, Y. Lu and **J. M. F. da Trindade,** "Partitioning Social Networks for Time-dependent Queries." *4th Workshop on Social Network Systems (SNS, co-located*

with EuroSys), Salzburg, Austria, April 2011.

J. M. F. da Trindade, C. Pham and N. Dautenhahn, *"μBeR: A Microkernel Based Rootkit for Android Smartphones." IEEE Symposium on Security and Privacy, Oakland, CA, May 2010* (paper) (poster).

G. Jacques-Silva, R. J. Drebes, J. Gerchman, **J. M. F. Trindade**, T. S. Weber and I. Jansch-Porto, "A Network-level Distributed Fault Injector for Experimental Validation of Dependable Distributed Systems." *30th Annual International Computer Software and Applications Conference (COMPSAC 2006), pp. 421-428, Chicago, USA, September 17-21, 2006.*

J. M. F. Trindade, G. Jacques-Silva, R. J. Drebes, T. S. Weber and I. Jansch-Porto, "Off-line Synchronization of Distributed Logs in Fault Injection Test Campaigns." *Proceedings of the 7th IEEE Latin-American Test Workshop (LATW 2006), pp. 137-142, Buenos Aires, Argentina, March 26-29, 2006.*

R. J. Drebes, G. Jacques-Silva, **J. M. F. da Trindade** and T. S. Weber, "A Kernel-based Communication Fault Injector for Dependability Testing of Distributed Systems." *IBM Verification Conference (IBM verification 2005), pp. 177-190, Haifa, Israel, November 13-16, 2005.*

M. Rafaelli, **J. M. F. Trindade,** G. Jacques-Silva, T. S. Weber and I. Jansch-Porto, "Fault Scenario Configuration for Experimental Validation of Distributed Applications in FIONA" (extended abstract, in Portuguese) *VI Regional School of High Performance (ERAD 2006), pp. 135-138, Ijui, Brazil, January 10-14, 2006.*

J. M. F. Trindade, G. Jacques-Silva, T. S. Weber and I. Jansch-Porto, "Generation of logs in Fault Injection Test Campaigns for Dependability Analysis of Distributed Applications" (in Portuguese). *III Regional School of Computer Networks (ERRC 2005), pp. 15-20, Santa Cruz do Sul, Brazil, August 18-20, 2005.*

SERVICE

External Reviewer
- 11th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2009)
- 15th IEEE Pacific Rim International Symposium on Dependable Computing (PRDC 2009)
- 2nd IEEE International Conference on Computer Science and its Applications (CSA 2009)
- 25th ACM Symposium On Applied Computing (SAC 2010)
- 40th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2010)
- 4th IFIP WG 11.11 International Conference on Trust Management (IFIPTM 2010)
- 7th IEEE International Conference on Autonomic Computing (ICAC 2010)

Misc Professional Service
- IEEE Cipher Newsletter reviewer for the technical sessions of the IEEE Symposium on Security and Privacy 2010 (Issue E96, May 31st 2010).
- Student organizer for ACM Reflections 2009 and Middleware 2009.

Outreach
- Tour guide for on-campus graduate housing visits during MIT's open visit days in March 2018.

- On-site recruiter with Google Inc. at Grace Hopper Conference 2015.
- On-campus recruiting for four years in a row at University of Illinois at Urbana-Champaign (with Bloomberg L. P. in 2012, with Google Inc. in 2013, 2014 and 2015).
- Habitat for Humanity project with Best of Bloomberg (BBOB) philanthropy program.
- Volunteer at Algorithms session at the Go Girls TechKnow 2010, IBM T. J. Watson Research Center.
- Panelist at Google: Robotics tech talk for Girls Who Code, and NYU's CSAW CyberSecurity Program for Young Women 2014 and 2015.
- Technovation Challenge 2014: Mentor of students from Brooklyn International High School that designed and implemented a clothing donation app.
- Per Scholas program: Teaching assistant for a class led by Raymond Blum (Google) on robotics using Arduino.

OTHER ACTIVITIES

- Radio show host at MIT's WMBR student radio (2016-18).
- Interests: bass guitar, fantasy and horror comic books, clickety clack mech keebs.

LANGUAGES   Portuguese (native), English, Spanish (basic)