




# Dr. Johnnatan Messias PEIXOTO AFONSO

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CV Last Revised: February 23, 2025

## EDUCATION

APR 2024 AUG 2018	<b><i>Ph.D. - Computer Science - Max Planck Institute for Software Systems (MPI-SWS) and Saarland University (UdS)</i></b> – Saarbrücken, Germany <ul style="list-style-type: none"><li>Successfully completed Ph.D. with <i>Magna Cum Laude distinction</i>, demonstrating exceptional academic excellence and rigorous research capabilities [5, 6, 9, 10].</li><li><b>Focus:</b> My research focuses on fairness concerns on blockchains and Decentralized Finance (DeFi).</li></ul>
JUN 2017 MAR 2015	<b><i>M.Sc. - Computer Science - Universidade Federal de Minas Gerais (UFMG)</i></b> – Brazil <ul style="list-style-type: none"><li><b>GPA:</b> 83/100 (very good)</li><li><b>Focus:</b> Research theory of social computing and data analysis to investigate users' interconnections and linguistic patterns on Twitter.</li></ul>
DEC 2014 MAR 2009	<b><i>B.Sc. - Computer Science - Universidade Federal de Ouro Preto (UFOP)</i></b> – Brazil <ul style="list-style-type: none"><li><b>GPA:</b> 8/10 (very good)</li><li><b>Focus:</b> Social Computing and Mobile Computing.</li><li><b>Honors and Sandwich year:</b> Granted a scholarship for academic excellence to study in a European university (Eötvös Loránd University) for 14 months.</li></ul>

## WORK EXPERIENCE

PRESENT NOV 2024	<b><i>Research Scientist - Max Planck Institute for Software Systems (MPI-SWS)</i></b> – Germany <ul style="list-style-type: none"><li>I lead research in blockchain technologies and decentralized finance, developing innovative mechanism designs for decentralized applications and DAOs that advance fairness, and governance with my contributions recognized through top-tier publications and prestigious awards.</li></ul>
OCT 2024 SEP 2023	<b><i>Research Scientist - Matter Labs (via Deel GmbH)</i></b> – Remote from Germany <ul style="list-style-type: none"><li>I led and contributed to projects focused on key areas including Sybil resistance and airdrop design [19, 13], decentralized governance [10], DeFi [2, 3, 4], and blockchain data research [21, 8].</li><li>I have served as a Program Committee (PC) member for ACM AFT 2024, ACM WWW 2024, and FC 2025.</li></ul>
SEP 2023 AUG 2018	<b><i>Ph.D. Research Assistant - Max Planck Institute for Software Systems (MPI-SWS)</i></b> <ul style="list-style-type: none"><li>I started a blockchain research group at the MPI-SWS to conduct research focused on fairness concerns on blockchains and transactions prioritization transparency [5, 6, 9, 10].</li><li>Focus: Blockchain data analysis, scientific publications, papers writing, leading research, built system to gather, process, and analyze blockchain data.</li></ul>
AUG 2022 FEB 2022	<b><i>Ph.D. Research Intern - Chainlink Labs</i></b> – Remote from Germany <ul style="list-style-type: none"><li>I worked on improving the Chainlink Price Feeds quality. I used time series analysis, data feed quality scoring, and reference price index during my internship.</li></ul>
JAN 2021 MAR 2020	<b><i>AI and scientific advisor - AI Robots</i></b> – Remote from Germany <ul style="list-style-type: none"><li>I worked voluntarily as a scientific advisor and team leader to help them scale their robotic AI solutions and train their software engineering team. This company is a young Brazilian startup approved in the 2020 Microsoft Program (We Ventures Fund).</li></ul>
JUL 2018 JUN 2017	<b><i>Data Scientist and Full Stack Software Engineer - Kunumi</i></b> – Brazil <ul style="list-style-type: none"><li>I helped build and deploy an automation system for medical appointment requests using AI to address compliance with each patient's insurance plan and medical conditions. This project was awarded as Brazil's most innovative health software in 2019 according to IT Forum 365, promoted by PwC and ITMidia.</li></ul>
MAY 2017 FEB 2017	<b><i>Research Intern - Max Planck Institute for Software Systems (MPI-SWS)</i></b> – Germany <ul style="list-style-type: none"><li>I contributed to Dr. Juhi Kulshrestha and Dr. Krishna P. Gummadi's research project that investigates political bias in social media and web search. Using Twitter data, I deployed web systems to help users measure their political leaning [14, 15].</li><li>I contributed to Dr. Mainack Mondal and Dr. Krishna P. Gummadi's research project on managing online data privacy and security via user exposure. I deployed web systems to help users to check for their longitudinal exposure on social media [17, 18].</li></ul>
JUN 2017 MAR 2015	<b><i>M.Sc. Research Assistant - Locus</i></b> – Universidade Federal de Minas Gerais (UFMG) – Brazil <ul style="list-style-type: none"><li>I worked on the research theory of social computing and data analysis to characterize Twitter users' interconnection and linguistic patterns from different demographic groups [16, 7, 11, 12, 22].</li></ul>

## SKILLS

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- **Blockchain:** Data analysis on Bitcoin and Ethereum, smart contracts, Decentralized Finance (DeFi), decentralized applications. Deployed an Ethereum archive node and analysed the miner's prioritization of 300 million transactions.
- **Data Science:** Social media data crawling, cleaning and analysis; feature engineering; descriptive and inferential statistics; time series analysis; econometrics; applied machine learning.
- **Soft Skills:** Scientific and non-scientific presentations, ownership, teaching, leadership, and self-management.
- **Languages:** Portuguese (native), English (professional), German (B1).

## PROJECTS

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- **Blockchain transparency:** Published scientific work in the area for both Bitcoin and Ethereum blockchains [5, 6, 9, 10].
- **Eleições sem Fake:** Developed many systems to help with the Fake News problem in Brazil. These systems were the key to investigating misinformation dissemination within public WhatsApp groups and led to multiple scientific publications [16, 20].
- **Who Makes Trends?:** Demographics of Trend Promoters is the distribution (or combination) of demographic groups (such as middle-aged white men, young Asian women, adolescent black men) in the crowd promoting (or posting about) a topic before the topic becomes Trending on Twitter [1].
- **Search Political Leaning of Twitter Users:** This system helps users to infer the political leaning (between democratic and republican) users on Twitter [14, 15].
- **Secondary Digital Footprint:** Users interact with others by mentioning their username in their tweets (e.g., while replying to other Twitter users' tweets or giving a shout-out). These conversations are their secondary digital footprint. Even if they delete their account or remove selected tweets, this secondary footprint is not deleted automatically and leaks information about them [17, 18].

## TEACHING

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- **2023** Organized and taught a summer seminar on Blockchains and Decentralized Finance (DeFi) at the Saarland University.
- **2019, 2020:** Teaching Assistant for Operating Systems at MPI-SWS and UdS.
- **2016, 2017:** Teaching Assistant for Analysis and Algorithm Design at UFMG.
- **2013:** Teacher of Design and Analysis of Algorithms; Operating Systems; and Introduction to Hardware for high school students at Escola Estadual Dom Silvério in Mariana, Brazil.

## HONORS AND AWARDS

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- **2024:** I have been invited, on behalf of the President of the Alexander von Humboldt Foundation, to represent Germany at the Indo-German INDOGFOE Symposium. The event brought together outstanding Indian and German scientists.
- **2024:** The paper *Liquid Staking Tokens in Automated Market Makers* received the **best paper award** from MARBLE 2024.
- **2024:** Successfully completed Ph.D. with *Magna Cum Laude distinction*, demonstrating exceptional academic excellence and rigorous research capabilities.
- **2023:** My seminar on Blockchains and Decentralized Finance (DeFi) has been nominated for the **“Busy Beaver” award** – an award for outstanding and excellent lectures at the Saarland University.
- **2022:** CISPA Summer School on Trustworthy Artificial Intelligence: Part of the approx. 100 students selected worldwide.
- **2019:** The Swiss Blockchain Winter School: Received a stipend award provided to selected students to participate in the event.
- **2019:** Our Kunumi's medical auditor project was awarded as Brazil's most innovative health software according to IT Forum 365, promoted by PwC and ITMidia.

## SELECTED TALKS

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- **2025:** The Writing is on the Wall: Analyzing the Boom of Inscriptions and its Impact on EVM Blockchains. Ethereum Zürich. Zürich, Switzerland.
- **2024:** Fairness Concerns in the Blockchain Ecosystem. INDOGFOE, Indo-German Frontiers of Engineering Symposium by Alexander von Humboldt Foundation. Mumbai, India.
- **2024:** Airdrops: Giving Money Away Is Harder Than It Seems. EthCC. Brussels, Belgium.
- **2024:** Understanding Blockchain Governance. SBC DAO Workshop. New York City, USA.
- **2023:** Dissecting Bitcoin and Ethereum Transactions: On the Lack of Transaction Contention and Prioritization Transparency in Blockchains. Financial Cryptography and Data Security (FC). Bol, Croatia.
- **2021:** Selfish & Opaque Transaction Ordering in the Bitcoin Blockchain: The Case for Chain Neutrality. ACM SIGCOMM Internet Measurement Conference (IMC). Virtual Event.
- **2019:** (Mis)Information Dissemination in WhatsApp: Gathering, Analyzing and Countermeasures. 5th International Conference on Computational Social Science (IC2S2). Amsterdam, NL.
- **2016:** From Migration Corridors to Clusters: The Value of Google+ Data for Migration Studies. IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM). San Francisco, US.

## PROGRAM COMMITTEE

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- Financial Cryptography and Data Security (FC'25), International Workshop on Cryptoasset Analytics (CAAW'25), Workshop on The Role of Education in FinTech and Innovation (FinTeAchIn'25), ACM Advances in Financial Technologies (AFT'24), ACM International World Wide Web Conference (WWW'24).

## SELECTED WORKS AND PUBLICATIONS

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My work has been published at top venues in Computer Science, including FC, IMC, WWW, ICWSM, CSCW, and more. Some of my scientific efforts have also been covered by the news media and specialized blogs, including The New York Times, The Huffington Post, MIT Tech Review, BBC Brasil, and Folha de São Paulo.

My publications reached a Google Scholar h-index of 16 with an i-10 index of 20. For a complete list of publications, kindly check my Google Scholar or DBLP profile.

- [1] Abhijnan Chakraborty, **Johnnatan Messias**, Fabrício Benevenuto, Saptarshi Ghosh, Niloy Ganguly, and Krishna P. Gummadi. Who makes trends? understanding demographic biases in crowdsourced recommendations. In *Proceedings of the 11th International AAAI Conference on Web and Social Media*, ICWSM'17, 2017.
- [2] Krzysztof Gogol, Robin Fritsch, Malte Schlosser, **Johnnatan Messias**, Benjamin Kraner, and Claudio Tessone. Liquid staking tokens in automated market makers. In *In proceedings of the Mathematical Research for Blockchain Economy (MARBLE)*, 2024. [Best paper Award](#).
- [3] Krzysztof Gogol, **Johnnatan Messias**, Deborah Miori, Claudio Tessone, and Benjamin Livshits. Layer-2 arbitrage: An empirical analysis of swap dynamics and price disparities on rollups, 2024.
- [4] Krzysztof Gogol, **Johnnatan Messias**, Deborah Miori, Claudio Tessone, and Benjamin Livshits. Quantifying arbitrage in automated market makers: An empirical study of ethereum zk rollups. In *In proceedings of the Mathematical Research for Blockchain Economy (MARBLE)*, 2024.
- [5] **Johnnatan Messias**, Mohamed Alzayat, Balakrishnan Chandrasekaran, and Krishna P. Gummadi. On blockchain commit times: An analysis of how miners choose bitcoin transactions. In *KDD Workshop on Smart Data for Blockchain and Distributed Ledger*, SDBD '20, 2020.
- [6] **Johnnatan Messias**, Mohamed Alzayat, Balakrishnan Chandrasekaran, Krishna P. Gummadi, Patrick Loiseau, and Alan Mislove. Selfish & Opaque Transaction Ordering in the Bitcoin Blockchain: The Case for Chain Neutrality. In *Proceedings of the ACM Internet Measurement Conference (IMC'21)*, 2021.
- [7] **Johnnatan Messias**, Fabrício Benevenuto, Ingmar Weber, and Emilio Zagheni. From migration corridors to clusters: The value of google+ data for migration studies. In *Proceedings of the 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining*, ASONAM '16, 2016.
- [8] **Johnnatan Messias**, Krzysztof Gogol, Maria Inês Silva, and Benjamin Livshits. The writing is on the wall: Analyzing the boom of inscriptions and its impact on evm-compatible blockchains. *arXiv:2405.15288*, 2024.
- [9] **Johnnatan Messias**, Vabuk Pahari, Balakrishnan Chandrasekaran, Krishna P. Gummadi, and Patrick Loiseau. Dissecting Bitcoin and Ethereum Transactions: On the Lack of Transaction Contention and Prioritization Transparency in Blockchains. In *Proceedings of the Financial Cryptography and Data Security (FC'23)*, 2023.
- [10] **Johnnatan Messias**, Vabuk Pahari, Balakrishnan Chandrasekaran, Krishna P. Gummadi, and Patrick Loiseau. Understanding blockchain governance: Analyzing decentralized voting to amend defi smart contracts. *arXiv:2305.17655*, 2023.
- [11] **Johnnatan Messias**, Lucas Schmidt, Ricardo Rabelo, and Fabrício Benevenuto. You followed my bot! transforming robots into influential users in twitter. *First Monday*, 18(7), July 2013.
- [12] **Johnnatan Messias**, Pantelis Vikatos, and Fabrício Benevenuto. White, man, and highly followed: Gender and race inequalities in twitter. In *Proceedings of the IEEE/WIC/ACM International Conference on Web Intelligence*, WI '17, New York, NY, USA, 2017. ACM.
- [13] **Johnnatan Messias**, Aviv Yaish, and Benjamin Livshits. Airdrops: Giving money away is harder than it seems. *arXiv:2312.02752*, 2023.
- [14] Juhi Kulshrestha, Motahhare Eslami, **Johnnatan Messias**, Muhammad Bilal Zafar, Saptarshi Ghosh, Krishna P. Gummadi, and Karrie Karahalios. Quantifying search bias: Investigating sources of bias for political searches in social media. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*, CSCW '17. ACM, 2017.
- [15] Juhi Kulshrestha, Motahhare Eslami, **Johnnatan Messias**, Muhammad Bilal Zafar, Saptarshi Ghosh, Krishna P. Gummadi, and Karrie Karahalios. Search bias quantification: investigating political bias in social media and web search. *Information Retrieval Journal*, 22(1), 2019.
- [16] Philippe Melo, **Johnnatan Messias**, Gustavo Resende, Kiran Garimella, Jussara Almeida, and Fabrício Benevenuto. Whatsapp monitor: A fact-checking system for whatsapp. In *Proceedings of the International AAAI Conference on Web and Social Media*, ICWSM'19, 2019.
- [17] Mainack Mondal, **Johnnatan Messias**, Saptarshi Ghosh, Krishna P. Gummadi, and Aniket Kate. Forgetting in social media: Understanding and controlling longitudinal exposure of socially shared data. In *Twelfth Symposium on Usable Privacy and Security (SOUPS 2016)*, 2016.

- [18] Mainack Mondal, **Johnnatan Messias**, Saptarshi Ghosh, Krishna P. Gummadi, and Aniket Kate. Longitudinal privacy management in social media: The need for better controls. *IEEE Internet Computing*, 21(3):48–55, May 2017.
- [19] Janna Joceli Omena, **Johnnatan Messias**, Alberto Cossu, Fabio Gouveia, Augusto Falcão, Riccardo Ventura, Andrea Benedetti, Minye Huang, and Linqi Ye. Digital methods for blockchain research, 07 2024.
- [20] Gustavo Resende, Philipe Melo, Hugo Sousa, **Johnnatan Messias**, Marisa Vasconcelos, Jussara Almeida, and Fabrício Benevenuto. Misinformation dissemination in whatsapp: Gathering, analyzing and countermeasures. In *Proceedings of the 2019 World Wide Web Conference, WWW '19*, 2019.
- [21] Maria Inês Silva, **Johnnatan Messias**, and Benjamin Livshits. A public dataset for the zkSync rollup. *arXiv:2407.18699*, 2024.
- [22] Pantelis Vikatos, **Johnnatan Messias**, Manoel Miranda, and Fabrício Benevenuto. Linguistic diversities of demographic groups in twitter. In *Proceedings of the 28th ACM Conference on Hypertext and Social Media, HT '17*. ACM, 2017.