

Henrique Assumpção

Belo Horizonte, Brazil

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Education

M.S. in Computer Science

Mar 2025 - Expected June 2026

Universidade Federal de Minas Gerais

Belo Horizonte, Brazil

- **Thesis subject:** Combinatorial parameters of Johnson graphs;
- **Advisors:** [Prof. Gabriel Coutinho](#) and [Prof. Csaba Schneider](#).

B.S. in Computer Science

Jan 2020 - Feb 2025

Universidade Federal de Minas Gerais (GPA: 94%)

Belo Horizonte, Brazil

- **Minor:** Pure Mathematics;
- **Undergraduate Thesis:** [Algebras, groups and graphs](#);
- **Advisor:** Prof. Gabriel Coutinho.

Experience

Researcher: Quantum algorithms for finance

Jan 2025 - Dec 2025

[Inter S.A./DCC-UFMG](#), Brazil

- Develops algorithms that leverage the power of quantum computers to solve complex financial tasks, such as portfolio optimization and fraud detection;
- Collaborates with a team of researchers from UFMG and industry experts from Inter in order to build efficient and robust quantum algorithms to be deployed for usage in the banking industry.

Researcher: Graph Theory and Optimization

Mar 2023 - Jan 2025

[DCC-UFMG](#), Brazil

- Conducted research in graph theory and semidefinite optimization, obtaining novel results for graph parameters related to NP-hard problems such as MAXCUT and MAX 2-SAT, and co-authored a paper exhibiting the results, to be published in 2025;
- Developed algorithms for the analysis of clinical data of human brains, employing techniques from graph theory, linear algebra and optimization, and co-authored a paper discussing the results, to be published in 2025.

Instructor: Data Science

Jun - Dec 2022

[Usiminas/DCC-UFMG](#), Brazil

- Instructed multidisciplinary teams of professionals in developing useful software programs for applications at Usiminas, by employing data analysis and machine learning algorithms;
- Taught Python programming concepts and technologies in the context of data science, such as Numpy and Pandas, and technologies related to machine learning, such as Pytorch and Tensorflow.

Intern: Money Laundering detection on banking networks

Aug 2021 - Feb 2022

[Inter S.A./DCC-UFMG](#), Brazil

- Created *DELATOR*, a Graph Neural Network framework in Pytorch and DGL for detecting money laundering on large banking transaction networks. The framework efficiently operated on a large-scale banking database with over 20 million accounts and 100 million transactions, and was successfully employed by Inter's Anti-Money Laundering team to detect new cases of suspicious activity;
- Co-authored a paper published at *IEEE Big Data 2022*, and attended the conference in Osaka, Japan, in order to present the paper's findings to the scientific community.

Researcher: Predictive Maintenance for industrial machinery

May - Jul 2021

[MINASLIGAS/DCC-UFMG](#), Brazil

- Constructed a Variational Autoencoder model in Pytorch for predictive maintenance on siderurgy machinery, leveraging structural information from time-series data in order to prototype an efficient model that yielded a 10% increase in overall accuracy;
- Contributed to the development of a production-ready full stack application for predictive maintenance for the machinery from MINASLIGAS.

Intern: A.I. Research & Development

Mar - Aug 2021

Plus Three, USA

- Implemented NLP models for question answering and language generation in web applications, enhancing user interaction with chatbots.;
- Researched innovative approaches to integrate chatbots into the company's website and authored educational AI articles for AlandYou, targeting minority groups in the US..

Researcher: Sentiment Analysis on Online Mental Health communities

Dec 2020 - May 2021

DCC-UFMG, Brazil

- Developed a novel Recurrent Neural Network model in Pytorch for sentiment analysis on mental health online communities. The model efficiently and accurately predicted shifts in the emotional tone of online users, and outperformed all considered baselines by an average of 20%;
- Co-authored a scientific paper published at *Future Generation Computer Systems*, an international journal that allowed for greater disclosure of our work.

Publications

- **Henrique S. Assumpção**, Fabrício Souza, Leandro Lacerda Campos, Vinícius T. de Castro Pires, Paulo M. Laurentys de Almeida, Fabrício Murai. [DELATOR: Money Laundering Detection via Multi-Task Learning on Large Transaction Graphs](#). *IEEE International Conference on Big Data (IEEE BigData)*, 2022. Earlier version published in *Brazilian Workshop on Social Network Analysis and Mining (BraSNAM)*, 2022.
- Bárbara Silveira, **Henrique S. Silva**, Fabrício Murai, Ana Paula C. da Silva. [Predicting user emotional tone in mental disorder online communities](#). *Future Generation Computer Systems*, 2021.

Awards & Achievements

- Best Paper Award at the *XI Brazilian Workshop on Social Network Analysis and Mining (BraSNAM)*, 2022.
- Achieved 2nd place in the admission test for Computer Science at *Universidade de São Paulo (USP)*, 2020.
- Receive Honorable Mentions for public speaking and argumentation for four consecutive years at SINUM (United Nations model simulation at Marista Dom Silvério High School), 2015 - 2018.

Skills

Programming Languages: Python, C++, C, Rust, JavaScript, SQL, Java, R, C#, Verilog, MATLAB, GNU Octave

Technologies: Pytorch, Tensorflow, Numpy, Scipy, Pandas, scikit-learn, Pytorch Geometric, DGL, StellarGraph, SageMath

MLOps: AWS Sagemaker, AWS Elastic Inference

DevOps: GitLab CI/CD

Backend Tools: MySQL, SQLite, Docker

Tools: Linux, Git, \LaTeX , Microsoft Excel, Microsoft Power BI

Languages: Portuguese (Native), English (C2), Spanish (B2), French (B1)