# Pedro Henrique da Costa Avelar

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Google Scholar, Github, Personal Blog, LinkedIn, Duolingo

## Objectives and Competences

I have used Python extensively, and I am also comfortable with C++, C#, C, Lua and SQL. In the past I have used Java, Haskell, Javascript, and Racket. I have done research and replicated state-of-the-art Deep Learning models in Pytorch, Tensorflow and Scikit-image, using Git/Github for versioning and Conda or Docker for containerising my experiments and personal projects. In the past I have also worked with other libraries and toolkits such as Choco, Flask, Gecode, Keras, NLTK, Scikit-Learn and Weka.

## Languages

Native Portuguese speaker, Fluent English (1 year exchange programme, 7.75 IELTS score in 2014, Grade A CAE in 2011), Beginner Chinese (HSK2), Beginner Spanish, and Beginner French (placed as A2 at the local Alliance Française's entry test).

## Education and Academic Experience

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|---|---|---|
| Current<br>Mar 2019 | **Universidade Federal do Rio Grande do Sul**<br>**PhD student** Artificial Intelligence<br>Advisor: Luís C. Lamb | Porto Alegre,<br>Brazil |
| | Implementing Graph Neural Networks and Attentional models for symbolic problems in either Pytorch or Tensorflow. Machine Learning teaching assistant, graded exercises about boosted random forests and neural networks. Studied Reinforcement Learning | |
| Feb 2019<br>Mar 2017 | **MSc** Computer Science: Artificial Intelligence<br>GPA: A<br>Advisor: Luís C. Lamb | |
| | Dissertation Title: Learning Centrality Measures with Graph Neural Networks. Relevant experience: Replicating and implementing state of the art models in symbolic domains. 6 co-authored papers (see Publications). Configuring the machines for the experiments. | |
| Jul 2017<br>2013 | **Universidade Federal de Uberlândia**<br>**BEng** Electrical/Computer Engineering<br>GPA: 84.43% | Uberlândia,<br>Brazil |
| | Participated in a Mathematics Scientific Initiation programme called PICME, focusing on Linear Algebra and Real Analysis. Participated in ACM ICPC programming contests and local programming competitions. | |
| Jul 2015<br>Aug 2014 | **University of Glasgow**<br>**Exchange Student** in Computer Science<br>GPA: A5 | Glasgow,<br>United Kingdom |
| | Participated in the Glasgow University Tech Society hackathon. | |

## Professional Experience

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|---|---|---|
| Jul 2015<br>Jan 2015 | **Clear Returns**<br>*Machine Learning/Data Analyst* | Glasgow,<br>United Kingdom |
| | Training predictive Machine Learning Models. Data Wrangling, Statistical Analysis and Visualization. Development and deployment of RESTful internal Micro-Services. | |

## Leadership

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|---|---|---|
| Aug 2018<br>Aug 2017 | **Universidade Federal do Rio Grande do Sul**<br>DACOMP **Postgraduate Student Representative** | Porto Alegre,<br>Brazil |
| | Representing the Postgraduate students before the Informatics Institute. Participating in meetings, discussing and voting for resolutions and norms that rule how the institute works. | |

## Publications

The papers I co-authored which are already published or accepted at peer-reviewed venues are listed below:

- **Learning to Solve NP-Complete Problems: A Graph Neural Network for the Decision TSP**. Marcelo de Oliveira Rosa **Prates**, Pedro Henrique da Costa **Avelar**, Henrique **Lemos** dos Santos, Luís C. **Lamb**, Moshe Ya'akov **Vardi**. Presented at **AAAI** 2019 (5204).
  **Major contributions:** Implementing the GNN block used in the experiments.

- **On Quantifying and Understanding the Role of Ethics in AI Research: A Historical Account of Flagship Conferences and Journals**. Marcelo de Oliveira Rosa **Prates**, Pedro Henrique da Costa **Avelar**, Luís C. **Lamb**. Presented at **GCAI** 2018.
  **Major contributions:** Data collection and processing of paper abstracts.

- **Assessing Gender Bias in Machine Translation − A Case Study with Google Translate**. Marcelo de Oliveira Rosa **Prates**, Pedro Henrique da Costa **Avelar**, Luís C. **Lamb**. Published at **Neural Computing and Applications**.
  **Major contributions:** Collecting BLS statistics on gender equality in the workforce. Wrangling the data to the format used in the final publication. Experimental work.

- **Multitask Learning on Graph Neural Networks − Learning Multiple Graph Centrality Measures with a Unified Network**. Pedro Henrique da Costa **Avelar**, Henrique Lemos dos **Santos**, Marcelo de Oliveira Rosa **Prates**, Luís C. **Lamb**. Presented at ICANN 2019 (Poster).
  **Major contributions:** Implementing the GNN block used in the experiments. Experimental work.

- **Graph Colouring Meets Deep Learning: Effective Graph Neural Network Models for Combinatorial Problems**. Henrique **Lemos** dos Santos, Marcelo de Oliveira Rosa **Prates**, Pedro Henrique da Costa **Avelar**, Luís C. **Lamb**. Accepted at **ICTAI** 2019 Preprint arXiv:1903.04598.
  **Major contributions:** Implementing the GNN block which was used in the experiments.

## Honors and Awards

- Scroll (Silver) Medal - Brazilian Linguistics Olympiad 2017 (ranking)

- Bronze Medal - Brazilian Public Schools Mathematics Olympiad 2009 (certificate)

- Bronze Medal - Minas Gerais' Mathematics Olympiad 2005 (certificate)

## Personal Interests

Language lover: 320 🔥 and counting! I am using Duolingo to learn Chinese (236 👑, 🏆) for fun, and recently started Italian (19 👑) to prepare for a Sandwich PhD in Italy, but I would like to learn many more languages throughout my life. I have a hobbyist interest in linguistics, having participated in the Brazilian Linguistics Olympiad in 2017, as well as conlanging. I'm also interested in Fractals/Procedural Content Generation, and Emergent Behaviour in games and agent-based AI systems.