Gonçalo **Faria**

LEAD MACHINE LEARNING ENGINEER

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Education

Instituto Superior Técnico, University of Lisbon *Lisbon, Portugal*

MASTER'S DEGREE IN DATA SCIENCE AND ENGINEERING *2019 - 2021*

- Profound focus on Bayesian Statistics and Statistical Learning, achieving a perfect score of 20/20 in PhD-level course on the subject.
- Received grades of 18/20 in both Natural Language Processing (NLP) and Reinforcement Learning, further broadening my expertise in machine learning.
- Excelled in a PhD course on Deep Structured Prediction with another perfect score of 20/20, emphasizing the importance of Bayesian thinking in the field.
- Was part of DeepSPIN research group (`https://deep-spin.github.io/`) led by André Martins.
- Collaborated closely with Professors **Mário Figueiredo and André Martins** for my master's dissertation, diving deep into the realms of causality and machine learning.
- Conducted comprehensive research on latent interventions to decode cause-effect relationships, blending disciplines such as causal discovery, deep latent variable models, structured prediction, and approximate posterior inference techniques. Developed an innovative method that leverages neural networks and variational inference to decipher causal relationships in environments with entirely latent interventions. The method was published in Faria, Martins, & Figueiredo (2022).
- Dissertation received a (20/20) grade (`https://arxiv.org/abs/2203.02336`).
- 18/20 average, class A in ECTS grading scale.

University of Minho *Braga, Portugal*

BACHELOR DEGREE IN COMPUTER SCIENCE ENGINEERING *2017 - 2019*

- 17/20 average, class A in ECTS grading scale.

University of Beira Interior *Covilhã, Portugal*

BACHELOR DEGREE IN COMPUTER SCIENCE ENGINEERING *2016 - 2017*

(First year only)

Professional Experience

2023 - 2024 **AI Researcher**, Instituto de Telecomunicações

- *I am part of the alignment and instruction tuning teams working on the TowerLLM project. We aim to train a 220B parameter LLM that will be the best open multilingual LLM.*
- *This was worked done with **André Martins**, as part of the Sardine group.*

2021 - 2023   **Lead ML Engineer**, Dotmoovs

- *Initial Role & MVP Development:*
- *System for counting soccer juggles using object detection and pose estimation.*
- *Enabled users to upload videos and receive a count of their soccer ball juggles with different body parts.*
- *Post-funding Expansion:*
- *Spearheaded the assembly and led an ML engineering team.*
- *Bolstered the model serving stack and rectified MVP's public launch edge cases.*
- *Incorporated multi-object tracking, and finetuned SOTA vision models using annotated user data.*
- *Led the establishment of data engineering pipelines to support business intelligence applications and develop recommender systems.*
- *Enhancing Activity Recognition Technology:*
- *Improved kinematics models to minimize juggle-counting errors.*
- *Introduced expanded capabilities to recognize more sports and activities.*
- *Utilized annotated user data for training juggle and freestyle football trick detection.*
- *Fitness, and Support:*
- *Expanded the activity recognition capabilities to over 100 fitness exercises.*
- *Introduction of NLU pipelines for the personal trainers' support channels.*
- *Using an LLM provider, created an AI coach to help the user with in-app navigation and training assistance.*

2021 - 2022   **Invited Teaching Assistant**, Instituto Superior Técnico

- *I was part of the team that taught the first MSc class exclusively about deep learning at IST. It was a valuable experience.*

2021 - 2021   **Student Researcher**, Instituto de Telecomunicações

- *Was part of DeepSPIN research group (`https://deep-spin.github.io/`) led by André Martins.*
- *Collaborated closely with Professors **Mário Figueiredo and André Martins** for my master's dissertation, diving deep into the realms of causality and machine learning.*
- *Conducted comprehensive research on latent interventions to decode cause-effect relationships, blending disciplines such as causal discovery, deep latent variable models, structured prediction, and approximate posterior inference techniques. Developed an innovative method that leverages neural networks and variational inference to decipher causal relationships in environments with entirely latent interventions. The method was published in Faria, Martins, & Figueiredo (2022).*

2020 - 2021   **Student Researcher**, Unbabel

- *I was involved in addressing the challenge of selecting the correct stylistic register when performing machine translation. This was a significant issue because while some languages (e.g., English) do not differentiate between stylistic registers, this distinction is crucial in other languages (e.g., Portuguese, where "you" can be translated as "tu" or "você"). The work I did was train transformers to perform register selection and conversion for many languages. We evaluate our system both intrinsically using the labeled dataset and for style transfer using Unbabel's own robust human evaluation process and, extrinsically, the system's quality as part of Unbabel's translation pipeline. Overall, the models worked well and improved the MT results on all the language pairs we worked on.*
- *The project moved into production and is now being used by many users.*
- *This was worked done with **Christine Maroti**, and **André Martins**.*

2018 - 2019	**Research Scholar**, Fundação Calouste Gulbenkian - Programa Novos Talentos Inteligência Artificial

- *In my undergraduate final year, I was fortunate to be selected for the "New Talents in Artificial Intelligence" program by the Gulbenkian Foundation, which provided a unique opportunity to delve into Deep Learning research whilst still an undergraduate. The program brought together like-minded individuals from universities across the country and facilitated collaborations with leading Portuguese researchers in the field. Through this platform, I had the privilege to meet some of the pioneers in the field, such as Stuart Russell, and to start my own research journey where I worked on my first research project, which tried to address a few limitations of what was then a new and exciting idea called Capsule Networks.*
- ***Project****: Equivariant models for discriminative learning with unstructured data(`https://arxiv.org/abs/1909.12737`)*
- ***Presented at****: INTERNATIONAL CONFERENCE ON OPTIMIZATION AND LEARNING 2020*
- ***Tutor:*** *Professor Doutor Cesar Analide*

2016 - 2016	**Supermarket Cashier**, Modelo Continente Hipermercados SA, Guimarães, Portugal

- *The lesson I took away was a deep understanding that every customer interaction is an opportunity to make a lasting impression. This foundational experience became a cornerstone for my entrepreneurial ambitions, emphasizing that an essential component of success lies in valuing and understanding every individual we serve.*

Publications

<small>PUBLISHED</small>

Faria, GRA, Martins, AFT, Figueiredo, MAT. 2022. Differentiable Causal Discovery Under Latent Interventions. CLEAR 2022.

Awards

2022	**APRP Prize - Best Master Thesis**, Portuguese Pattern Recognition Association Associação Portuguesa de Reconhecimento de Padrões(APRP) establishes the APRP prize for the best master's thesis, with the purpose of distinguishing work of high merit in the area of pattern recognition in Portugal.
2022	**Prémio Prof. Luís Vidigal**, IST (Instituto Superior Técnico) - University of Lisbon It is intended to award Masters of any master's degree at IST annually, authors of the best Master's Thesis whose theme falls within the scientific areas of Electrical and Computer Engineering and Informatics.
2020	**Prémio Almedina**, University of Minho Awarded annually to the best scholarship student of each Organic Teaching and Research Unit.

Invited Talks

Causal Data Science Meeting 2022 : Causal Discovery under Latent Interventions

Deep Learning Sessions Portugal : Causal Discovery and Deep Learning

Causality Discussion Group : Causal Discovery under Latent Interventions

Teaching Experience

2023	**13th Lisbon Machine Learning Summer School(LxMLS)**, Lab Monitor `http://lxmls.it.pt/2023/`	*IST*
2022	**Deep Learning**, Invited Teaching Assistant	*IST*
2021	**11th Lisbon Machine Learning Summer School(LxMLS)**, Lab Monitor `http://lxmls.it.pt/2021/`	*IST*
2017	**CeSIUM - University of Minho Computer Enginnering Students Center**, Colaborator in the Pedagogical Department	*Braga*

Complementary Education

2018	**Structuring Machine Learning Projects**, Andrew Ng via Coursera (deeplearning.ai) An online non-credit course authorized by deeplearning.ai and offered through Coursera. Credential ID: 6NNX58JYWP2L
2018	**Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization**, Andrew Ng via Coursera (deeplearning.ai) An online non-credit course authorized by deeplearning.ai and offered through Coursera. Credential ID: EAMS2XZZ8MBD
2018	**Neural Networks and Deep Learning**, Andrew Ng via Coursera (deeplearning.ai) An online non-credit course authorized by deeplearning.ai and offered through Coursera. Credential ID: JNQJW39U2H6X
2017	**Machine Learning**, Andrew Ng via Coursera (Stanford University) An online non-credit course authorized by Stanford University and offered through Coursera. Credential ID: 87CHL2E4476N