

# Patrick FERNANDES

## PERSONAL DATA

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ADDRESS: 211 S Evaline St #2, Pittsburgh PA, United States  
PHONE: +1 412 214 2326  
EMAIL: [pattuga@gmail.com](mailto:pattuga@gmail.com)  
WEBSITE: [coderpat.github.io](http://coderpat.github.io)  
GITHUB: [CoderPat](https://github.com/CoderPat)

## ACADEMIC QUALIFICATIONS

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*Current* Doctor of Philosophy in LANGUAGE TECHNOLOGIES  
**Carnegie Mellon University**, Pittsburgh  
Doctor of Philosophy in ELECTRICAL AND COMPUTER ENGINEERING  
**Instituto Superior Técnico**, Lisbon  
*Advised by André Martins & Graham Neubig*

JUNE 2018 Master of Philosophy in ADVANCED COMPUTER SCIENCE  
**University of Cambridge**, Cambridge  
Distinction

JULY 2017 Bachelor of Science in COMPUTER ENGINEERING  
**Instituto Superior Técnico**, Lisbon  
Average Grade: 19/20  
*Graduated 1st out of class of 170*

JULY 2014 High School Degree in SCIENCE  
**Escola Secundária “Ferreira Dias”**, Sintra  
Average Grade: 18/20  
*Graduated 1st out of class of 1000+*

## PUBLICATIONS

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Preprint	WHEN DOES TRANSLATION REQUIRE CONTEXT? A DATA-DRIVEN, MULTILINGUAL EXPLORATION K. Yin, <b>P. Fernandes*</b> , A. Martins, G. Neubig <a href="https://arxiv.org">arXiv.org</a>	* = (co-)first authorship
Published	QUALITY-AWARE DECODING FOR NEURAL MACHINE TRANSLATION <b>P. Fernandes*</b> , A. Farinhas, R. Rei, José. Souza, P. Ogayo, A. Martins, G. Neubig A. Martins <a href="#">2022 Meeting of the North American Chapter of the Association for Computational Linguistics (NAACL 2022)</a>	
	CMU’s IWSLT 2022 DIALECT SPEECH TRANSLATION SYSTEM B. Yan, <b>P. Fernandes</b> , S. Dalmia, J. Shi, Y. Peng, D. Berrebbi, X. Wang, G. Neubig, S. Watanabe <a href="#">19th International Conference on Spoken Language Translation (IWSLT) @ ACL 2022</a> <b>Winners</b>	
	PREDICTING ATTENTION SPARSITY IN TRANSFORMERS M. Treviso, A. Góis, <b>P. Fernandes</b> , E. Fonseca, A. Martins <a href="#">6th Workshop on Structured Prediction for NLP @ ACL 2022</a>	
	MEASURING AND INCREASING CONTEXT USAGE IN CONTEXT-AWARE MACHINE TRANSLATION <b>P. Fernandes*</b> , K. Yin, G. Neubig, A. Martins <a href="#">59th Annual Meeting of the Association for Computational Linguistics (ACL 2021)</a>	
	DO CONTEXT-AWARE TRANSLATION MODELS PAY THE RIGHT ATTENTION? K. Yin, <b>P. Fernandes</b> , D. Pruthi, A. Chaudhary, A. Martins, G. Neubig <a href="#">59th Annual Meeting of the Association for Computational Linguistics (ACL 2021)</a>	
	STRUCTURED NEURAL SUMMARIZATION <b>P. Fernandes*</b> , M. Allamanis, M. Brockschmidt. <a href="#">7th International Conference on Learning Representations (ICLR 2019)</a>	

## WORK EXPERIENCE

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- FEB. 2020 | Research Intern at UNBABEL, Lisbon  
- AUG. 2020 | *Machine Translation*  
Worked on improving internal generic translations engines using latest research techniques. Rewrote the internal library to train and fine-tune models in order to bridge the gap between the experimentation and production setting.
- SEPT. 2018 | AI Resident at MICROSOFT RESEARCH, Cambridge  
- SEPT. 2019 | *Deep Program Understanding & Reinforcement Learning*  
Worked as an AI Resident, a new 1-year training program designed to train and prepare the residents to be Researchers or Research Engineers in the AI area. Worked on unsupervised learning for anomaly detection in APIs usages in the first 6 months and worked on reinforcement learning for improving exploration in commercial games in the last 6 months.
- SUMMER 2018 | Research Internship at MICROSOFT RESEARCH, Cambridge  
*Deep Program Understanding*  
Worked in trying to learn better distributed representations for source code functions using graph neural networks by exploiting control and data flow information extractable from the parse trees. Also developed a novel graph neural network model that is able to exploit a sequencing in the graph and applied this model to source code and natural language summarization
- OCT. 2015 | Researcher at CODACY, Lisbon  
- JUNE 2016 | *Machine Learning for Static Code Analysis*  
Due to a good performance in the internship at INESC-ID, was invited to do some research for CODACY, a company that focus on static analysis tools for companies and developers. Our research group focus on possible applications of machine learning algorithms for automatic code analysis task where "standard" algorithms struggle achieve good results.
- SUMMER 2015 | Research Intern at INESC-ID, Lisbon  
*Natural Language Processing*  
Applied for a summer internship in my first year, and did some research on the application of DNA alignment algorithms to automatic audio extraction from movies, for a easier creation of labelled audio datasets to use in NLP projects

## TEACHING

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- JAN-MAY. 2022 | **CMU 11-737: Multilingual NLP**, *Teaching Assistant*  
APRIL. 2022 | **CMU 11-611: Natural Language Processing**, *Guest Lecturer (Machine Translation)*

## MENTORING

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- Sean Chang, *BSc at SCS@CMU*
- Jimin Sun, *MLT at LTI@CMU*
- Soundarya Krishnan, *MSc at MLD@CMU*
- Manley Roberts, *MSc at MLD@CMU*
- Deep Karkhanis, *MSc at MLD@CMU*

## SERVICE

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### Organization:

- *WMT Chat Translation Task*, 2022, Organizer
- *Structured Prediction for NLP*, 2022, Programme Committee
- *Lisbon Machine Learning School*, 2021, Monitor

### Reviewer:

- *ACL Rolling Review*, January 2021 (NAACL 2022 cycle)
- *ACL Rolling Review*, November 2021 (ACL 2022 cycle)
- *Structured Prediction for NLP*, workshop at ACL 2021
- *Language Resources and Evaluation*, 2021
- *Transactions on Software Engineering*, 2021
- *Graph Representation Learning and Beyond*, workshop at ICML 2020
- *Graph Representation Learning*, workshop at NeurIPS 2019.
- *Representation Learning on Graphs and Manifolds*, workshop at ICLR 2019.

### Open-Source:

- *Ducttape*, Workflow manager for research experiments, Maintainer
- *HuggingFace*, Library for pretrained language models, Contributor
- *OpenGNN*, Library for machine learning for graph-structured data, Sole Developer
- *scikit-learn*, Library for machine learning in Python, Minor Contributor.

## TALKS

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- APR. 2021 **Measuring and Increasing Context Usage**, *CMU Portugal Symposium*
- APR. 2021 **Explainable AI and How to Evaluate It**, *Deep Learning Sessions Lisbon*
- FEB. 2021 **Measuring and Increasing Context Usage**, *Reading Group, Unbabel*
- NOV. 2018 **Structured Neural Summarization**, *AI + Pizza, Microsoft Research Cambridge*

## AWARDS & SCHOLARSHIPS

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- SEPT. 2019 Merit Scholarship for the best student of the bachelors in the year 2016/2017 (out of 300+).
- SEPT. 2019 Merit Scholarship for the best student of the bachelors in the year 2015/2016 (out of 300+).
- AUGU. 2016 Excellency Award for outstanding performance on the academic year 2014/2015.
- SEPT. 2014 Ferreira Dias' Best Student Award of the year 2013/2014.

## SKILLS AND INTERESTS

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LANGUAGES: Portuguese (Native); English(Fluent, IELTS Band 8.5); Spanish (Intermediate); Japanese (Basic)

TECHNICAL SKILLS: Python (jax, pytorch, tensorflow, scikit, numpy) , Octave, Java, C++, C

RESEARCH INTERESTS: Machine Learning, Natural Language Processing, Machine Translation, Explainability, Reinforcement Learning, Program Understanding, Computational Neuroscience