
Curriculum Vitae

Luís Cruz

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1 Personal Information

Full Name Luís Miranda da Cruz

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Nationality Portuguese

Date of Birth 15/01/1989

Country of Residence Netherlands

Orcid [0000-0002-1615-355X](https://orcid.org/0000-0002-1615-355X)

Website <https://luiscruz.github.io>

Current Job Assistant Professor at TU Delft.

2 Education

MAP-i Doctoral Programme in Computer Science PhD with *cum laude*. University of Porto; July 2019.

Thesis: *Tools and Techniques for Energy-Efficient Mobile Application Development*.

Advisor: Prof. Rui Abreu.

Integrated Master in Informatics and Computing Engineering Faculdade de Engenharia da Universidade do Porto (FEUP); September 2006 – July 2011.

Final grade: 17 out of 20 (A on the European Grading Scale).

M.Sc. thesis: *Humanoid Robot Nao: Developing Behaviours for Soccer Humanoid Robots*.

Advisor: Prof. Luis Paulo Reis.

Science Major Escola Secundária de Barcelinhos (High School); September 2003 – July 2006.

Final grade: 18 out of 20 (A on the European Grading Scale).

3 Work Experience

★ **Assistant Professor** Delft University of Technology, The Netherlands; **November 2020 – Present**.

★ **Master Coordinator** Computer Science Master. Delft University of Technology, The Netherlands; **2021 – Present**.

★ **Scientific Coordinator** [AI for Fintech Research](#), The Netherlands; **January 2020 – Present**.

Postdoctoral Researcher Delft University of Technology, The Netherlands; **September 2019 – October 2020**.

Guest Lecturer Instituto Superior Técnico, Portugal; **2018 – 2020**.

Teaching Software Engineering in the Software and Information Systems Engineering (SISE) program.

Visiting Researcher Monash University, Australia; **September 2018 – December 2018**.

Researcher INESC-ID, Lisbon, Portugal; **January 2017 – July 2019**.

Researcher GSL GreenLab, INESC-TEC, Porto, Portugal; **2016–2019**.

Lecturer Instituto Superior Técnico (IST), University of Lisbon, Portugal; **2017/2018**.

Lectured the Software Engineering courses.

Research Assistant Palo Alto Research Center (Xerox PARC), California, USA; **May 2015 – December 2015**.

Worked in machine learning and mobile computing research projects.

Lecturer FEUP, University of Porto, Portugal; **2013/14 and 2014/15**.

Lectured the unit course Software Development Laboratory (LDSO).

Software architect and Web developer Tecla Colorida, Lda., Porto, Portugal; **2012 – 2013**.

Software Engineer *Escolinhas Criativas* consortium, University of Porto, Portugal; **2011 – 2012**.

Developed a social media platform.

Researcher FEUP, University of Porto, Portugal; **August – September 2010**.

Designing an aspect-oriented language in the scope of the AMADEUS project – Aspects and Compiler Optimizations for Matlab System Development.

Teaching Assistant FEUP, University of Porto, Portugal; **2009/2010**. Assisted teaching activities for Computer Graphics courses.

4 Relevant Training

- University Teaching Qualification (UTQ / BKO). 2024
- Data Analyst Nanodegree by Udacity; co-created by Facebook, MongoDB and Zipfian Academy. 2016.
- Scalable Machine Learning (CS190.1x) by BerkeleyX. 2015.

5 Honors and Awards

Best Paper Award CAIN, 2023.

Most Influential Paper Award MOBILESoft, 2023.

Distinguished Reviewer Award MSR, 2023.

Cum Laude MAP-i Doctoral Programme in Computer Science, University of Porto 2019.

Best Presentation Award BENEVOL, The 18th Belgium-Netherlands Software Evolution Workshop, 2019.

Best Paper Award CIbSE XXI Ibero-American Conference on Software Engineering, 2018.

Academic Excellence Award Faculdade de Engenharia da Universidade do Porto, 2008.

6 Teaching

Sustainable Software Engineering (CS4415) 2021/22, 2022/23

Release Engineering for ML Applications (CS4295) 2020/21, 2021/22, 2022/23

Literature Review (IN4306) 2021/22, 2022/23, 2023/24

MOOC AI in Practice: Preparing for AI (edX)

MOOC AI in Practice: Applying AI (edX)

Software Engineering University of Lisbon; 2017/18.

Software Development Laboratory (LDSO) University of Porto; 2013/14, 2014/15.

7 Student Supervision

Luís has advised/is advising the following students:

Ph.D. student – Arumoy Shome (TU Delft) Engineering Artificial Intelligence in the Wild. *Ongoing. Graduating in 2025.*

Ph.D. student – Lorena Poenaru-Olaru (TU Delft) Concept drift adaption for AIOps. *Ongoing. Graduating in 2025.*

Ph.D. student – Eileen Kapel (TU Delft) Incident Management in Large Fintech Organisations. *Ongoing.*

Ph.D. student – Santiago (UPC Barcelona Tech) Green AI. *Ongoing. Graduating in 2027.*

Otto Kaaij Greening Space Engineering Software. *Ongoing.*

Thijs Nulle Lowering Carbon Emissions within AI Models. *Ongoing.*

Enrique Barba Roque Investigating energy hotspots with Docker and Tracing. *Ongoing.*

Wander Siemers Energy testing in Mobile Software. *Ongoing.*

Koen Hagen E-Compare: Energy Regression Testing for Software Applications. *Ongoing.*

Natália Struharová Approximated Computing in Continuous Integration Pipelines. May 2024

Rover van der Noort Sustainability of Edge AI at scale. May 2024

Rens Hidra Measuring up to stability: Guidelines towards accurate energy consumption measurement results of Rust benchmarks. May 2024

Dyon van der Ende Catalog of Energy Patterns for Websites. April, 2024

Sara Regali Green Quantization. April 2024

Mihai Anton Minimize experimentation overhead through dataset selection, approximated pipeline execution using proxy models, and data collection feedback. May 2024

Nienke Nijkamp GreenAI for Deep Learning Ensembles, April 2024

Joost Göbbels (TU Delft) Hawkes processes for large scale service systems, September 2023

Abel Van Steenweghen (TU Delft) EasyCompress – Automated Compression for Deep Learning Models, July 2023.

Erik Blokland (TU Delft) EDATA: Energy Debugging And Testing for Android, June 2023.

Ching-Chi Chuang (TU Delft) How to remove dependencies from large software projects with confidence, August 2022.

Niels Bauman (TU Delft) Building a generalisable ML pipeline at ING, July 2022.

Haiyin Zhang (TU Delft) Automated Detection of Code Smells for Machine Learning Applications, July 2022.

Nils Hullegien (TU Delft) Detecting anti-patterns in a MSA using distributed tracing, July 2022.

Niek van der Plas (TU Delft) Detecting PII in Git commits, July 2022.

Tim E. R. Yarally (TU Delft) Green AI, July 2022.

Bart Ziengs (TU Delft) A Human-In-the-Loop System for Interpreting Image Recognition Models, June 2022.

Bart van Oort (TU Delft) Engineering Best Practices for Machine Learning projects, October 2021.

Yuanhao Xie (TU Delft) AI Model Lifecycle Management: Systematic Mapping Study and Solution for AI Democratisation, November 2020.

Ricardo Morais (IST) Automatic refactoring for energy efficiency in continuous integration pipelines, September 2020.

Mark Haakman (TU Delft) Studying the Machine Learning Lifecycle and Improving Code Quality of Machine Learning Applications, July 2020.

Pedro Gomes (IST) Detecting User Sessions and Inferring User Satisfaction in the Context of a Search Engine for Legislative Contents, December 2019.

8 Media Coverage

TU Delft Stories [Sustainable artificial intelligence: from ChatGPT to green AI](#). 2023

Dutch TV news Nieuwsuur [TV report](#) and [online article](#). 2023

Podcast [EnvironmentalVariables](#), episode 8, talking about Green Software education. 2022

Branch Magazine [Green Software Development Is The Only Software Development We Need](#). 2022

SDTimes [Build environmental sustainability into your development teams](#) 2021

9 Invited Seminars and Talks

SURF Research day Panel Discussion on Sustainable AI.

BarcelonaTech Greening AI. Invited by Silverio Martinez-Fernandez. 2023.

IPA Fall days Let's make software Green! 2023

MOBILESoft Most Influential Paper talk. 2023.

ISEP VII Jornadas de Engenharia de Sistemas [Sustainability for Happiness](#). 2023.

BIN@Netherlands Discussion panel on Energy Efficiency. 2022

Exact Talk at the Sustainability Hackathon. 2022

DELix 2019 Invited Speaker: Lisbon Winter School on Data Science and Engineering, 2019

FutureOfComputing 2019 Invited Speaker: 2nd UPTEC School on the Future of Computing, 2019

Software Analytics Research group at SMU Invited by David Lo. 2018.

University of South Australia Invited by Wolfgang Mayer. 2018.

DELix 2018 Invited Speaker: Lisbon Winter School on Data Science and Engineering, 2018

10 Scientific Committees

IEEE Software Guest editor on Green Clean Software Special issue.

CAIN 2025 Program chair, together with Qinghua Lu.

QUATIC 2024 Sustainable Software Theme chair.

Euromicro SEAA 2024 Program Committee.

ESEM 2024 Publicity co-chair and Program Committee.

ICSE 2024 Publicity Chair.

MSR 2024 Local Chair.

CAIN 2024 Industry track chair, Mentor in the Doctoral Symposium.

MOBILESoft 2024 Program Chair Research Forum track.

ICSE 2023 Chair of Student competition SCORE.

MSR 2023 Program Committee.

MOBILESoft 2023 Program Committee.

CAIN 2023 2nd Conference on AI Engineering – Software Engineering for AI (Program Committee)

ICT4S 2023 Program Committee.

Euromicro SEAA 2022 Program Committee.

CAIN 2022 1st Conference on AI Engineering – Software Engineering for AI – CAIN’22@ICSE’22 (Program Committee)

GZW 2022 1st The First International Workshop on Greening the Web (Program Committee)

ECML PKDD 2022 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (Program Committee)

WAIN 2021 1st Workshop on AI Engineering – Software Engineering for AI – WAIN’21@ICSE’21 (Program Committee)

ICT4S 2022 Industry co-chair and Publicity co-chair.

MOBILESoft 2022 Program Committee.

ESEC/FSE 2022 Organiser of the Virtual Run.

MobileSoft 2021 8th IEEE/ACM International Conference on Mobile Software Engineering and Systems (Program Committee)

ISEC 2021 14th Innovations in Software Engineering Conference (Program Committee)

ICSE 2021 Organiser of ICSE is running

SUSTAINSE 2020 1st International Workshop on Sustainable Software Engineering (Program Committee)

ICSEA 2020 The Fifteenth International Conference on Software Engineering Advances (Program Committee)

MaLTeSQuE 2020 Workshop on Machine Learning Techniques for Software Quality Evolution (Program Committee)

ESEC/FSE 2020 Artifact Evaluation Committee

ICSME 2020 36th IEEE International Conference on Software Maintenance and Evolution (Program Committee)

EASEAI 2020 2nd International Workshop on Education through Advanced Software Engineering and Artificial Intelligence (Program Committee)

SEAA 2020 Euromicro Conference on Software Engineering and Advanced Applications 2020 (Program Committee)

ISEC 2020 13th Innovations in Software Engineering Conference (Program Committee)

MobileSoft 2020 7th IEEE/ACM International Conference on Mobile Software Engineering and Systems (Publicity Co-Chair; Program Committee)

ICST 2020 International Conference on Software Testing and Validation, 2020 (Web Chair; Program Committee)

ISMIR2019 International Society for Music Information Retrieval (Organisation)

MobileSoft 2019 6th IEEE/ACM International Conference on Mobile Software Engineering and Systems (Tool Demos & Mobile Apps Co-Chair; Session Chair)

POPL 2019 46th ACM SIGPLAN Symposium on Principles of Programming Languages (Student Volunteer)

QRS 2018 IEEE International Conference on Software Quality, Reliability & Security, 2018 (Local Chair)

MobileSoft 2018 5th IEEE/ACM International Conference on Mobile Software Engineering and Systems (Publicity Co-Chair; Session Chair)

CIbSE 2018 21st Conferencia Iberoamericana de Software Engineering, 2018 (Student Volunteer)

ICST 2017 International Conference on Software Testing and Validation, 2017 (Student Volunteer)

11 Selected Publications

- [1] Santiago del Rey, Silverio Martínez-Fernández, Luís Cruz, and Xavier Franch. Do dl models and training environments have an impact on energy consumption? *Euromicro SEAA*, 2023.
- [2] Roberto Verdecchia, June Sallou, and Luís Cruz. A systematic review of green ai. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, page e1507, 2023.
- [3] Tim Yarally, Luís Cruz, Daniel Feitosa, June Sallou, and Arie van Deursen. Batching for green ai—an exploratory study on inference. *Euromicro SEAA*, 2023.
- [4] Tim Yarally, Luís Cruz, Daniel Feitosa, June Sallou, and Arie van Deursen. Uncovering energy-efficient practices in deep learning training: Preliminary steps towards green ai. In *CAIN23, 2nd International Conference on AI Engineering - Software Engineering for AI*, 2023.
- [5] Ching-Chi Chuang, Luis Cruz, Robbert van Dalen, Vladimir Mikovsk, and Arie van Deursen. Removing dependencies from large software projects: are you really sure? In *22nd IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM)*, 2022.
- [6] Jai Kannan, Scott Barnett, Luís Cruz, Anj Simmons, and Akash Agarwal. Mlsmellhound: A context-aware code analysis tool. In *2022 IEEE/ACM 44th International Conference on Software Engineering: New Ideas and Emerging Results (ICSE-NIER)*, 2022.
- [7] Lorena Poenaru-Olaru, Luis Cruz, Arie van Deursen, and Jan S. Rellermeyer. Are concept drift detectors reliable alarming systems? - a comparative study. In *7th Workshop on Real-time Stream Analytics, Stream Mining, CER/CEP Stream Data Management in Big Data*, 2022.
- [8] Arumoy Shome, Luís Cruz, and Arie van Deursen. Data smells in public datasets. In *CAIN’22 - 1st International Conference on AI Engineering – Software Engineering for AI*, 2022.
- [9] Bart van Oort, Luís Cruz, Babak Loni, and Arie van Deursen. ”project smells” – experiences in analysing the software quality of ml projects with mllint. In *2022 IEEE/ACM 44th International Conference on Software Engineering: Software Engineering In Practice (ICSE-SEIP)*, 2022.
- [10] Roberto Verdecchia, Luís Cruz, June Sallou, Michelle Lin, James Wickenden, and Estelle Hotelier. Data-centric green ai an exploratory empirical study. In *2022 International Conference on ICT for Sustainability (ICT4S)*, 2022.
- [11] Haiyin Zhang, Luís Cruz, and Arie van Deursen. Code smells for machine learning applications. In *CAIN’22 - 1st International Conference on AI Engineering – Software Engineering for AI*, 2022.

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- [12] Daniel Feitosa, Luís Cruz, Rui Abreu, João Paulo Fernandes, Marco Couto, and João Saraiva. *Patterns and Energy Consumption: Design, Implementation, Studies, and Stories*, pages 89–121. Springer International Publishing, Cham, 2021.
 - [13] Mark Haakman, Luís Cruz, Hennie Huijgens, and Arie van Deursen. Ai lifecycle models need to be revised. *Empirical Software Engineering*, 26(5):1–29, 2021.
 - [14] P. Heck, G Schouten, and Luis Cruz. A software engineering perspective on building production-ready machine learning systems. In Valentina Chkoniya, editor, *Handbook of Research on Applied Data Science and Artificial Intelligence in Business and Industry*, chapter 2, pages 23–54. IGI Global, 2021.
 - [15] Sofia Reis, Rui Abreu, and Luís Cruz. Fixing vulnerabilities potentially hinders maintainability. *Empirical Software Engineering*, 2021.
 - [16] Bart van Oort, Luís Cruz, Maurício Aniche, and Arie van Deursen. The prevalence of code smells in machine learning projects. In *2021 IEEE/ACM 1st Workshop on AI Engineering - Software Engineering for AI (WAIN)*, pages 1–8, 2021.
 - [17] Luis Cruz and Rui Abreu. Catalog of energy patterns for mobile applications. *Empirical Software Engineering*, 2019.
 - [18] Luis Cruz and Rui Abreu. EMaaS: Energy measurements as a service for mobile applications. In *ICSE (NIER)*, 2019.
 - [19] Luis Cruz and Rui Abreu. Improving energy efficiency through automatic refactoring. In *Journal of Software Engineering Research and Development*, 2019.
 - [20] Luis Cruz and Rui Abreu. On the energy footprint of mobile testing frameworks. *IEEE Transactions on Software Engineering*, 2019.
 - [21] Luis Cruz, Rui Abreu, John Grundy, Li Li, and Xin Xia. Do energy-oriented changes hinder maintainability? In *ICSME*, 2019.
 - [22] Luis Cruz, Rui Abreu, and David Lo. To the attention of mobile software developers: Guess what, test your app! *Empirical Software Engineering*, 2019.
 - [23] Pedro Gomes, Bruno Martins, and Luís Cruz. Segmenting user sessions in search engine query logs leveraging word embeddings. In *International Conference on Theory and Practice of Digital Libraries*, pages 185–199. Springer, 2019.
 - [24] Luis Cruz and Rui Abreu. Measuring the energy footprint of mobile testing frameworks. In *Proceedings of the 40th International Conference on Software Engineering: Companion Proceedings, ICSE*, pages 400–401, 2018.
 - [25] Luis Cruz and Rui Abreu. Using automatic refactoring to improve energy efficiency of android apps. In *XXI Ibero-American Conference on Software Engineering (CIbSE, Best Paper Award)*, 2018.
 - [26] Luis Cruz and Rui Abreu. Performance-based guidelines for energy efficient mobile applications. In *IEEE/ACM International Conference on Mobile Software Engineering and Systems, MobileSoft*, pages 46–57, 2017.
 - [27] Luis Cruz, Rui Abreu, and Jean-Noël Rouvignac. Leafactor: Improving energy efficiency of Android apps via automatic refactoring. In *Proceedings of the 4th International Conference on Mobile Software Engineering and Systems, MOBILESoft '17*, pages 205–206. IEEE Press, 2017.
 - [28] Luis Cruz, Jonathan Rubin, Rui Abreu, Shane Ahern, Hoda Eldardiry, and Daniel G Bobrow. A wearable and mobile intervention delivery system for individuals with panic disorder. In *Proceedings of the 14th International Conference on Mobile and Ubiquitous Multimedia*, pages 175–182. ACM, 2015.

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- [29] Pedro Strecht, Luis Cruz, Carlos Soares, João Mendes-Moreira, and Rui Abreu. A comparative study of regression and classification algorithms for modelling students' academic performance. In *Educational Data Mining 2015*, 2015.
 - [30] Luis Cruz, Luis Paulo Reis, Nuno Lau, and Armando Sousa. Optimization approach for the development of humanoid robots' behaviors. In *Ibero-American Conference on Artificial Intelligence*, pages 491–500. Springer, Berlin, Heidelberg, 2012.
 - [31] Luis Cruz, Luis Paulo Reis, and Luis Rei. Generic optimization of humanoid robots' behaviours. In *15th Portuguese Conference on Artificial Intelligence, EPIA*, pages 385–397. Lisbon, 2011.