

Lucas Resck

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Education

University of Cambridge, Language Technology Lab

Cambridge, UK

PhD in Computation, Cognition and Language

Oct 2024 – Sept 2028

- Supervisors: Profs. Anna Korhonen and Isabelle Augenstein (University of Copenhagen)
- Affiliations: ELLIS PhD Student, Cambridge Trust Scholar, Girton College Member

Getulio Vargas Foundation (FGV), Visual Data Science Lab

Rio de Janeiro, Brazil

MSc in Mathematical Modelling

Feb 2022 – May 2024

- Supervisors: Profs. Jorge Poco and Marcos Raimundo (State University of Campinas, Brazil)

Rice University; Visual, Language, and Learning Lab

Houston, US

Visiting Scholar in Computer Science

Oct 2022 – Dec 2022

- Supervisor: Prof. Vicente Ordóñez

Getulio Vargas Foundation (FGV)

Rio de Janeiro, Brazil

BSc in Applied Mathematics

Dec 2017 – Jan 2022

- Supervisor: Prof. Jorge Poco
- 1st in class, GPA 3.86/4.0 (9.66/10.0, lowest passing grade of 6)

Federal Center for Technological Education of Minas Gerais (CEFET-MG)

Varginha, Brazil

Technician Diploma in Mechatronics

2015 – 2017

- High school researcher fellow and volunteer

Research Projects

Survey on explainability and interpretability of multilingual LLMs

Nov 2024 – present

- Surveyed 200+ papers on multilingual explainability (preprint available).
- Categorised existing literature according to the explainability techniques employed, the multilingual tasks addressed, the languages investigated and available resources.
- Identified key challenges, distilled core findings and outlined promising avenues for future research.

Improving NLP model explanations using human annotations

Dec 2021 – Mar 2024

- Developed a novel contrastive-inspired loss to incorporate human annotations into NLP classification in a model- and explainer-agnostic way (**NAACL Findings 2024**, LatinX in NLP, MSc thesis).
- Employed a multi-objective optimizer to explore the trade-off between the contrastive and the original losses.
- Significantly improved the plausibility of post-hoc explanations (relative increase of 3.49% for a language model) without substantially degrading model performance.

Design of a novel explainer for GNN node classification

July 2022 – Jan 2023

- *Distill n' Explain (AISTATS 2023)* first distills the original GNN into an interpretable one and then explains the latter.
- Designed and proved lemmas and theorems that guarantee the method's explanation faithfulness.
- The proposed explainer outperformed previous methods in explanation accuracy while being orders of magnitude faster.

Development of a visual analytics system to explore citations in legal documents

Aug 2020 – Feb 2022

- *LegalVis (TVCG 2023, VIS 2022, BSc thesis)* employs ML, NLP, XAI and data visualization to infer non-explicit citations in Brazilian legal documents.
- Tested a diverse set of NLP classifiers (Transformers, word embeddings and bag-of-words) and achieved high accuracy (96%) in identifying citations.
- Employed a model-agnostic explainer (LIME) to explain the inferred citations.

Development of a visual analytics system to apply legal understandings

Feb 2022 – present

- *LegalAnalytics (AI & Law 2025)* employs ML, NLP, XAI and visualization methods to assist judicial experts in the application of understandings from the Brazilian Supreme Court.
- Conducted a literature review on XAI in the legal domain (under review).

Application of machine learning to binding precedents

June 2021 – Apr 2025

- Explored ML, NLP and topological data analysis in legal documents that cite Brazilian binding precedents (**AI & Law 2025**).
- Managed the annotation of legal documents by experts (contribution to other papers).

Study of legal language models with topological data analysis

Apr 2023 – Sept 2024

- Exploration of the intersection between NLP and topological data analysis in legal documents.
- Publications expected in 2025.

Study of training data attribution

Oct 2022 – Sept 2024

- Explored methods to attribute model predictions to training data.
- Investigated the intersection between attribution, datamodeling and machine unlearning.

Publications

Lucas Resck, Isabelle Augenstein and Anna Korhonen. 2025. Explainability and Interpretability of Multilingual Large Language Models: A Survey. OpenReview. Preprint.

Raphaël Tinarrage, Henrique Ennes, **Lucas Resck**, Lucas T. Gomes, Jean R. Ponciano and Jorge Poco. 2025. Empirical analysis of binding precedent efficiency in Brazilian Supreme Court via case classification. **Artificial Intelligence and Law**. Accepted for publication.

Lucas Resck, Felipe Moreno-Vera, Tobias Veiga, Gerardo Paucar, Ezequiel Fajreldines, Guilherme Klafke, Luis G. Nonato and Jorge Poco. 2025. LegalAnalytics: bridging visual explanations and workload streamline in Brazilian Supreme Court appeals. **Artificial Intelligence and Law**. Accepted for publication.

Lucas Resck, Marcos M. Raimundo and Jorge Poco. 2024. Exploring the Trade-off Between Model Performance and Explanation Plausibility of Text Classifiers Using Human Rationales. **NAACL Findings 2024**. Also presented as a poster at the LatinX in NLP at NAACL 2024 workshop.

Lucas E. Resck, Jean R. Ponciano, Luis Gustavo Nonato and Jorge Poco. 2023. LegalVis: Exploring and Inferring Precedent Citations in Legal Documents. IEEE Transactions on Visualization and Computer Graphics (**TVCG 2023**). Presented at **VIS 2022**.

Tamara Pereira, Erik Nascimento, **Lucas E. Resck**, Diego Mesquita and Amauri Souza. 2023. Distill n' Explain: explaining graph neural networks using simple surrogates. **AISTATS 2023**.

Theses and Reports

Lucas Emanuel Resck Domingues. 2024. Balancing performance and explanation plausibility: a multi-objective approach to text classification with human rationales. MSc thesis, Getulio Vargas Foundation, Rio de Janeiro, Brazil.

Lucas Emanuel Resck Domingues. 2021. Inferring and Explaining Potential Citations to Binding Precedents in Brazilian Supreme Court Decisions. BSc thesis, Getulio Vargas Foundation, Rio de Janeiro, Brazil.

Lucas Emanuel Resck Domingues and Júlia Gandini Blahun. 2018. Circuits for Driving Low Power Direct Current Motors. Technical report, Federal Center for Technological Education of Minas Gerais, Varginha, Brazil.

Júlia Gandini Blahun, Luiza de Souza Pinto Regina and **Lucas Emanuel Resck Domingues**. 2016. Brazilian Robotics Olympiad – OBR'2016, Level II Practical Modality. Technical report, Federal Center for Technological Education of Minas Gerais, Varginha, Brazil.

Contribution to Other Papers

Beatriz Sabdin Chagas, Carla Marcondes Damian and Raphaël Tinarrage. 2022. The Impact of the Súmula Vinculante 26 on the Decrease of Similar Demands at the STF: a Quantitative Analysis With Machine Learning Models. XI International Meeting of CONPEDI. Law team: Beatriz Sabdin Chagas, Carla Marcondes Damian, Ana Clara Macedo Jaccoud, Pedro Burlini de Oliveira. Math team: Henrique Hennes, Jorge Poco, Jean Roberto Ponciano, **Lucas Resck**, Raphaël Tinarrage.

Ana Clara Macedo Jaccoud, Pedro Burlini de Oliveira and Raphaël Tinarrage. 2022. Regime Progression for Heinous Crimes in Brazilian Supreme Court (STF): an Empirical Analysis of Súmula Vinculante 26. XI International Meeting of CONPEDI. Law team: Beatriz Sabdin Chagas, Carla Marcondes Damian, Ana Clara Macedo Jaccoud, Pedro Burlini de Oliveira. Math team: Henrique Hennes, Jorge Poco, Jean Roberto Ponciano, **Lucas Resck**, Raphaël Tinarrage.

Teaching Experience

Professor

Getulio Vargas Foundation (FGV)

Rio de Janeiro, Brazil

Jan 2023 – Apr 2023

Professor of Introduction to Programming in Python in a Web Systems Development course.

Teaching Assistant

Getulio Vargas Foundation (FGV)

Rio de Janeiro, Brazil

Mar 2020 – June 2021

Teaching assistant of Ordinary Differential Equations, Calculus in Several Variables and Calculus in One Variable.

Work Experience

Summer Intern

EloGroup

Rio de Janeiro, Brazil

Dec 2019 – Feb 2020

Conducted time series analysis, exploratory data analysis, sanity checks on databases and data preprocessing.

Summer Intern

PSR

Rio de Janeiro, Brazil

Jan 2019 – Feb 2019

Developed and implemented optimization models for maintenance schedules and dispatch of power plants, utilizing Julia and optimization packages.

Honours, Awards and Scholarships

ELLIS PhD Student

PhD student under the [ELLIS PhD & Postdoc Program](#).

Oct 2024 – Sept 2028

Cambridge International Scholarship

[Cambridge Trust](#)'s scholarship to cover tuition fees and maintenance costs.

Oct 2024 – Sept 2027

Young Researcher

[11th Heidelberg Laureate Forum \(HLF\)](#) Young Researcher.

Sept 2024

G-Research scholarship

Registration and travel grant for [EDS 2024](#).

Paris, France

Aug 2024

Google and Zendesk scholarship

Registration and travel grant for [LxMLS 2024](#).

Lisbon, Portugal

July 2024

[NAACL Diversity and Inclusion Award](#)

Registration and partial travel grant for NAACL 2024.

Mexico City, Mexico

June 2024

MSc scholarship

FGV scholarship: tuition fees and monthly stipend.

Feb 2022 – May 2024

Invited speaker

Presentation *How the mathematics olympiads transformed my life* to motivate students from Colégio União, invited by Prof. Aguinaldo Borba.

Três Corações, Brazil

Mar 2023

CAPES PROSUP scholarship

Coordination for the Improvement of Higher Education Personnel (CAPES)'s Graduate Support Program for Private Education Institutions (PROSUP) scholarship to partially cover tuition fees.

May 2022 – Feb 2023

Academic distinguished undergraduate award

Ranked 1st in my undergraduate class. Recognition of academic excellence (grades and research).

Apr 2022

Talent Selection Program

Hosted by the Center for the Development of Mathematics and Sciences of FGV.

Dec 2017 – Jan 2022

- Scholarship holder (tuition fee and monthly stipend).
- Selected based on my performance in mathematical olympiads and the entrance exam.

PICME scholarship

Undergraduate Research and Master's Program (PICME) scholarship.

Aug 2018 – July 2021

- It was only possible because of my mathematical olympiad medals before college.
- I did research and took graduate courses during my undergraduate studies with a scholarship.

High School Research Fellowship

Scholarship holder at CEFET-MG and the National Council for Scientific and Technological Development (CNPq) in the High School Research Fellowship.

Mar 2017 – Feb 2018

1st place in the FGV entrance exam

1st place in the entrance exam for the Applied Mathematics undergraduate program (24 candidates).

Nov 2017

Olympiad medals

2012 – 2017

- Brazilian Public School Mathematics Olympiad (OBMEP): Gold (1 medal), silver (3) and bronze (1) medals and honourable mention (1).
- Brazilian Astronomy and Astronautics Olympiad (OBA): Silver (2) and bronze (1) medals.

Skills

Programming: Python, C++, Julia, R, MATLAB/Scilab, LaTeX

Machine Learning: PyTorch, scikit-learn, HuggingFace Transformers, TensorFlow, Keras

Technologies: Git, Pandas, NumPy, Linux

Languages: English (fluent, TOEFL: 112/120), Portuguese (native)

Other: First Aid for Sport (British Red Cross)

Volunteering

Cambridge University Brazilian Society (CUBS)

Communications Officer.

Cambridge, UK

Dec 2024 – present

FAccT 2024

Volunteer at the [ACM Conference on Fairness, Accountability, and Transparency 2024](#).

Rio de Janeiro, Brazil

June 2024

Academic Directory of Applied Mathematics at FGV

Treasurer.

Aug 2018 – Aug 2019

International Congress of Mathematicians (ICM) 2018

Volunteer at the [ICM 2018](#).

Rio de Janeiro, Brazil

Aug 2018

Events, Schools and Workshops Attended

[11th Heidelberg Laureate Forum \(HLF\)](#)

Selected as a Young Researcher and presented an artistic work at the Intercultural Science Art Project.

Heidelberg, Germany

Sept 2024

[ELLIS Doctoral Symposium \(EDS\) 2024](#)

Presentation of a poster of the **NAACL Findings 2024** paper.

Paris, France

Aug 2024

[Lisbon Machine Learning School \(LxMLS\) 2024](#)

Presentation of a poster of the **NAACL Findings 2024** paper.

Lisbon, Portugal

July 2024

[NAACL 2024](#) and [LatinX in NLP](#)

Paper presentation.

Mexico City, Mexico

June 2024

[FAccT 2024](#)

Volunteer.

Rio de Janeiro, Brazil

June 2024

[Tropical Probabilistic AI School 2024](#)

Presentation of a poster of the **NAACL Findings 2024** paper.

Rio de Janeiro, Brazil

Jan 2024

Seminar for Postgraduate Students at FGV (SEPEMAp)

Presentation of the **NAACL Findings 2024** paper.

Rio de Janeiro, Brazil

Oct 2023

[XLII Brazilian Congress of Applied and Computational Mathematics \(CNMAC 2023\)](#)

Bonito, Brazil

Sept 2023

[Latin American Congress on Industrial and Applied Mathematics \(LACIAM\) 2023](#)

Rio de Janeiro, Brazil

Jan 2023

[Summer School on Data Science 2023](#)

Rio de Janeiro, Brazil

Jan 2023

[IEEE VIS: Visualization & Visual Analytics 2022](#)

Presentation of the **TVCG 2023** paper.

Oklahoma City, US

Oct 2022

[8th Workshop on Mathematical Solutions for Industrial Problems](#)

Organised by the Research Center in Mathematics Applied to Industry (CeMEAI) at the University of São Paulo.

São Paulo, Brazil (virtual)

Mar 2022

International Congress of Mathematicians (ICM) 2018

Volunteer.

Rio de Janeiro, Brazil

Aug 2018

High School Research Course ([Mentores](#))

Scholarship holder (CNPq) at the Plane Analytical Geometry course for medalists of OBMEP.

Virtual

2016

High School Research Program ([PIC-Jr](#))

Scholarship holder (CNPq) at the mathematics course for medalists of OBMEP.

Varginha, Brazil

2013 – 2015