Curriculum Vitæ

Personal Information

Lucas Emanuel Resck, BSc (full name: Lucas Emanuel Resck Domingues)
MSc student in Mathematical Modeling
Fundação Getulio Vargas
School of Applied Mathematics
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Education

2022–present **MSc, Mathematical Modeling**
Fundação Getulio Vargas (FGV EMAp), Rio de Janeiro – RJ, Brazil
Scholarship holder at FGV EMAp
Advisor: Jorge Poco

2018–2021 **BSc, Applied Mathematics**
Fundação Getulio Vargas (FGV EMAp), Rio de Janeiro – RJ, Brazil
Scholarship holder at the Center for the Development of Mathematics and Sciences (CDMC) of FGV
Final grade: 9.66/10 — academic distinguished undergraduate award
Thesis: Inferring and Explaining Potential Citations to Binding Precedents in Brazilian Supreme Court Decisions
Advisor: Jorge Poco

2015–present **Technical education, Mechatronics**
Federal Center for Technological Education of Minas Gerais (CEFET-MG), Varginha – MG, Brazil
Incomplete (missing internship) in favor of BSc.

Academic Experience

02/2022–present **Visual Data Science Lab**
Master's researcher
Fundação Getulio Vargas, Rio de Janeiro, Brazil

Research topics: machine learning, natural language processing, explainable artificial intelligence
Supervisor: Jorge Poco

10/2022–12/2022 **Vision, Language, and Learning Lab**
Visiting scholar
Department of Computer Science of Rice University, Houston, USA
Research topics: training data attribution, machine learning, natural language processing, explainable artificial intelligence, computer vision
Supervisor: Vicente Ordóñez

09/2020–02/2022 **Visual Data Science Lab**
Undergraduate researcher
Fundação Getulio Vargas, Rio de Janeiro, Brazil
Research topics: machine learning, data science, natural language processing
Supervisor: Jorge Poco

03/2017–02/2018 **Federal Center for Technological Education of Minas Gerais**
Junior scientific initiation fellow
Federal Center for Technological Education of Minas Gerais (CEFET-MG), Brazil
Research topic: Circuits for driving low power direct current motors
Supervisor: Antonio José Bento Bottion

03/2016–02/2017 **Federal Center for Technological Education of Minas Gerais**
Scientific initiation volunteer
Federal Center for Technological Education of Minas Gerais (CEFET-MG), Brazil
Research topic: Brazilian Robotics Olympiad (OBR) 2016, Practical Modality
Supervisor: Paulo Henrique Cruz Pereira

Professional Experience

12/2019–02/2020 **EloGroup**
Summer Intern in Data Science

01/2019–02/2019 **PSR Power Systems Research**
Summer Intern in Optimization

Pedagogical Experience

01/2023–04/2023 **Fundação Getulio Vargas**
Educational Development Institute (IDE)
Position: Professor of Introduction to Programming
Course: Web Systems Development

03/2021–06/2021 **Fundação Getulio Vargas**
Teaching assistant of Ordinary Differential Equations

08/2020–11/2020 **Fundação Getulio Vargas**
Teaching assistant of Calculus in Several Variables

03/2020–06/2020 **Fundação Getulio Vargas**
Teaching assistant of Calculus in One Variable

Publications

Journal Publications

1. **Resck, L. E.**, Ponciano, J. R., Nonato, L. G., and Poco, J. LegalVis: Exploring and Inferring Precedent Citations in Legal Documents. *IEEE Transactions on Visualization and Computer Graphics 29*, 6 (June 2023), 3105–3120. Presented at IEEE VIS: Visualization & Visual Analytics 2022. Date of Publication: 18 February 2022

Conferences

1. Pereira, T., Nascimento, E., **Resck, L. E.**, Mesquita, D., and Souza, A. Distill n' Explain: explaining graph neural networks using simple surrogates. In *Proceedings of The 26th International Conference on Artificial Intelligence and Statistics* (Valencia, Spain, Apr. 2023), vol. 206 of *Proceedings of Machine Learning Research*, PMLR, pp. 6199–6214. ISSN: 2640-3498

Theses

1. **Domingues, L. E. R.** *Inferring and Explaining Potential Citations to Binding Precedents in Brazilian Supreme Court Decisions.* BSc thesis, Fundação Getulio Vargas, Rio de Janeiro, Brazil, Dec. 2021

Technical Reports

1. **Domingues, L. E. R.**, and Blahun, J. G. Circuits for Driving Low Power Direct Current Motors. Scientific initiation project report, Federal Center for Technological Education of Minas Gerais, Varginha, Brazil, 2018. Original title in Portuguese: "Circuitos para Acionamento de Motores de Corrente Contínua de Baixa Potência"

2. Blahun, J. G., Regina, L. d. S. P., and **Domingues, L. E. R.** Brazilian Robotics Olympiad – OBR'2016, Level II Practical Modality. Scientific initiation project report, Federal Center for Technological Education of Minas Gerais, Varginha, Brazil, 2016. Original title in Portuguese: "Olimpíada Brasileira de Robótica – OBR'2016, Modalidade Prática de Nível II"

Contributions to Other Papers

1. Chagas, B. S., Damian, C. M., and Tinarrage, R. The Impact of the Súmula Vinculante 26 on the Decrease of Similar Demands at the STF: a Quantitative Analysis With Machine Learning Models. p. 22. 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**, Raphäel Tinarrage. Original title in Portuguese: "O Impacto da Súmula Vinculante 26 na Diminuição de Demanda Similar no STF: uma Análise Quantitativa por Modelos de Machine Learning"

2. Jaccoud, A. C. M., de Oliveira, P. B., and Tinarrage, R. Regime Progression for Heinous Crimes in Brazilian Supreme Court (STF): an Empirical Analysis of Súmula Vinculante 26. p. 20. 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**, Raphäel Tinarrage. Original title in Portuguese: "Progressão de Regime em Crimes Hediondos no Supremo Tribunal Federal: Uma análise Empírica pela Súmula Vinculante 26"

Projects

2023–present **Training Data Attribution**, at FGV EMAp and Rice University. Recent project on the exploration of methods to attribute model predictions to training data. Additionally, investigation of the behavior of the weights in learning and *unlearning* of neural networks.

2023–present **Legal Language Models and Topological Data Analysis**, at FGV EMAp. Recent project on the exploration of the intersection between NLP and topological data analysis in legal documents.

2022–present **Similarity Analysis in Decisions of the Brazilian Supreme Court**, at FGV EMAp. "LegalAnalytics" project. Application of machine learning, NLP, explainable AI, and visualization methods for the creation of the LegalAnalytics system to assist judicial experts in the application of understandings from the Brazilian Supreme Cort (STF). Publications are expected.

2021–present **Exploration of Human Annotations to Improve NLP Model Explanations**, at FGV EMAp. This project is my MSc thesis. Publications are expected.

2021–present **Machine Learning and Súmulas Vinculantes**, at FGV EMAp. Exploration of computational methods, especially machine learning, NLP, and topological data analysis, in legal documents that cite Brazilian binding precedents ("Súmulas Vinculantes"). The project also explored the annotation of legal documents by experts. Resulted in Contributions to Other Papers 1 and 2. Publications are expected.

2020–2021 **Topological Data Analysis in Legal Documents**, at FGV EMAp. Employment of machine learning, NLP, explainable AI, and data visualization methods to create the LegalVis data visualization system to infer and explore citations in legal documents (Journal Publication 1). Topological data analysis was considered in future work.

Volunteering

1. **IMPA** National Institute for Pure and Applied Mathematics. Support team member at ICM 2018. 08/2018.
2. **DAMA** Academic Directory of Applied Mathematics at FGV. Treasurer. 08/2018–08/2019.

Honors, Awards & Scholarships

05/2022–02/2023	Scholarship (tuition fee) holder in the Graduate Support Program for Private Education Institutions (PROSUP) of the Coordination for the Improvement of Higher Education Personnel (CAPES).
04/2022	Academic distinguished undergraduate award.
2022–present	MSc scholarship holder at FGV EMAp.
08/2018–07/2021	Scholarship holder in the Scientific Initiation and Master's Program (PICME).
2018–2021	Selected by the Talent Selection program from the Center for the Development of Mathematics and Sciences (CDMC) of FGV. BSc scholarship holder.
2017	1st place at FGV EMAp's entrance exam.
03/2017–02/2018	Scholarship holder at the CEFET-MG and the National Council for Scientific and Technological Development (CNPq) in the Junior Scientific Initiation Fellowship.
2012–2017	Brazilian Public School Mathematics Olympiad (OBMEP). Gold (1), silver (3), and bronze (1) medals, and honorable mention (1).
2012–2017	Brazilian Astronomy and Astronautics Olympiad (OBA). Silver (2) and bronze (1) medals.

Schools and Workshops Attended

2023	Summer School on Data Science. FGV EMAp.
2022	8th Workshop on Mathematical Solutions for Industrial Problems. Research Center in Mathematics Applied to Industry (CeMEAI) at the University of São Paulo.
2016	Junior scientific initiation course (Mentores) in mathematics (plane analytical geometry) for medalists of the Brazilian Public Schools Mathematics Olympiad (OBMEP). Scholarship holder at CNPq.
2013–2015	Junior Scientific Initiation Program (PIC-Jr) in mathematics for medalists of the Brazilian Public Schools Mathematics Olympiad (OBMEP). Scholarship holder at CNPq.

Languages

Portuguese (native)

English (BRASAS proficiency certificate: 1155167ABF96708C7826980)

Reference

Prof. Dr. Jorge Poco (BSc & MSc advisor)

Position: Professor at Fundação Getulio Vargas – FGV

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[*CV compiled on October 6, 2023 for the website https://lucasresck.github.io/*]

Rio de Janeiro – Brazil, October 6, 2023