

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
2015–2017	Technical education, Mechatronics Federal Center for Technological Education of Minas Gerais (CEFET-MG), Varginha – MG, Brazil

ACADEMIC EXPERIENCE

02/2022–present	Visual Data Science Lab Master's researcher Fundação Getulio Vargas, Rio de Janeiro, Brazil
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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**, Raphaël 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**, Raphaël 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 <i>unlearning</i> 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 Court (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

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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

02/2023	Invited speaker at Colégio União, Três Corações, Brazil. Presentation “How the mathematics olympiads transformed my life” to motivate students at the invitation of professor Aguinaldo Borba.
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 Undergraduate Research 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.

EVENTS, SCHOOLS, & WORKSHOPS ATTENDED

2023	Global Challenges Project’s Existential Risk Workshop . Boston, USA. Discussion of AI safety and future.
2023	Seminar for FGV EMaP Postgraduate Students (SEPEMaP). Presentation of my MSc work.
2023	XLII Brazilian National Congress of Applied and Computational Mathematics (CNMAC 2023) . Bonito, Brazil.
2023	Latin American Congress on Industrial and Applied Mathematics (LACIAM) 2023 . FGV EMaP.
2023	Summer School on Data Science . FGV EMaP.

- 2022 [IEEE VIS: Visualization & Visual Analytics 2022](#). Oklahoma City, USA. Presentation of Journal Publication 1.
- 2022 [8th Workshop on Mathematical Solutions for Industrial Problems](#). Research Center in Mathematics Applied to Industry (CeMEAI) at the University of São Paulo.
- 2018 International Congress of Mathematicians (ICM) 2018. Rio de Janeiro, Brazil.
- 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

Institute: School of Applied Mathematics (EMAp)

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[CV compiled on November 9, 2023 for the website <https://lucasresck.github.io/>]

Rio de Janeiro – Brazil, November 9, 2023