Fabricio Murai

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Graph ML • Online Social Networks • Fairness in AI

Education

University of Massachusetts Amherst   **Amherst, MA**
Ph.D. in Computer Science   *Feb 2014 – Aug 2016*
Advisor: Don Towsley
Dissertation: "Applications of Sampling and Estimation on Networks"

University of Massachusetts Amherst   **Amherst, MA**
M.S. in Computer Science   *Jul 2011 – Feb 2014*
Advisor: Don Towsley

Universidade Federal do Rio de Janeiro   **Rio de Janeiro, Brazil**
M.S. in Systems and Computer Engineering   *Mar 2008 – Apr 2011*
Advisors: Edmundo de Souza e Silva, Daniel Figueiredo

Universidade Federal do Rio de Janeiro   **Rio de Janeiro, Brazil**
B.S. in Computer Science   *Mar 2003 – Aug 2007*
Graduated *Magna Cum Laude* (Rank: 1/120)

Work Experience other than Teaching

Politecnico di Torino   **Turin, Italy**
Visiting Professor, **Host**: *Marco Mellia*   *Dec 2018 – Feb 2019*

LinkedIn Inc.   **Sunnyvale, CA**
SNA Intern, Research topic: Network A/B testing, **Manager**: *Ya Xu*   *Jun 2015 – Aug 2015*

University of Massachusetts Amherst   **Amherst, MA**
Graduate Research Assistant   *Jul 2011 – Aug 2016*

Teaching Experience

Worcester Polytechnic Institute   **Worcester, MA**
Assistant Professor   *Aug 2022 – Present*
Computer Science Department, Data Science Program

Universidade Federal de Minas Gerais   **Belo Horizonte, Brazil**
Associate Professor   *Jan 2020 – Aug 2022*
Department of Computer Science

Universidade Federal de Minas Gerais   **Belo Horizonte, Brazil**
Assistant Professor   *Jan 2017 – Jan 2020*
Department of Computer Science

Teaching Innovations at WPI

○ **Fall 2023. CS/DS541: Deep Learning:** (i) reorganized course structure and revised slides to deliver core concepts earlier in the course; (ii) added more advanced concepts (e.g., relation between large flat regions in loss landscape and generalization, double descent phenomenon); (iii) included new content: advances in Graph Neural Networks and Diffusion Models; (iv) designed 10 weekly in-class quizzes from scratch to boost attendance; (v) defined detailed rubric for course project; (vi) designed questions to provide initial intuition on backpropagation, included in the assignment preceding the one where students actually have to implement the algorithm; (vii) designed new homework question on multi-head attention; (viii) crafted a new Exam from scratch accounting for learning outcomes and mindfully balancing the questions' difficulty.

○ **Fall 2022. CS/DS541: Deep Learning:** (i) expanded course materials on Graph Neural Networks; (ii) designed new homework on RNN sequence-to-sequence models for text data with attention and word embeddings.

Courses Taught at WPI

The following table shows the average course report ratings students gave on Question #1 (overall course rating), Question #2 (instructor rating), and Question #9 (amount learned) for each class session instructed on a five point scale (1: "Very Poor"; 5: "Excellent").

Year	Term	Course	Class Size	#Responses	Q1	Q2	Q9
2023	D	CS 4423: Database Systems 2	80	-	-	-	-
2024	Spring	CS/DS 541: Deep Learning	60	-	-	-	-
2023	Fall	CS/DS 541: Deep Learning[†]	62	56	3.5	3.5	4.3
2023	D	CS 4423: Database Systems 2	75	55	4.1	3.9	4.3
2022	Fall	CS/DS 541: Deep Learning	35	31	4.2	4.3	4.5

[†] Ratings may have been impacted by strict compliance with WPI's academic integrity policy leading to the filing of 8 departmental agreement forms.

Undergraduate projects advised and co-advised at WPI

MQP (Major Qualifying Project) Advising..

MQP1. 2023-2024, Alexander MacDonald (CS), Nur Fateemah (CS), Jakob Simmons (CS), Ethan Vaz Falcao (DS+Math). "Mining graph patterns in software development from code repositories.", Co-advisor: Frank Zou.

MQP2. 2023-2024, Cristobal Rincon Rogers (CS+RBE), Liliana Loughlin (RBE), Matthew Sweeney (RBE), Yuhan Wu (CS+RBE). "Wheeled Robot with Robotic Arm for Collecting Trash on WPI Campus.", Co-advised with Andre Rosendo (primary advisor, RBE).

MQP3. 2022-2023, Calvin Rambacher (DS), Dinmukhamed Umbetzhan (CS). "Clinical Trial Prediction via Natural Language Processing and Graph Mining.", Co-advised with Xiaozhong Liu (primary advisor).

IQP Advising..

IQP1. 2023-2024, Qixing Xue (CS). "Improving Computing Efficiency and Reducing Carbon Footprint for Turing Cluster.", Co-advisor: Ermal Toto.

REU Advising..

REU1. 06/2023 – 08/2023, NSF Data Science REU site (PI: Elke Rundensteiner).

Mentored team of 3 students leading to undergraduate publication [C1.]:
– Libby Tiderman (ASU) → applying to graduate school
– Juan Sanchez Mercedes (Bryant) → transferred to Boston University
– Fiona Romanoschi (UT Austin).
Ph.D. mentor: Shannon Song (DS)

Graduate theses and dissertations advised at WPI

WPI PhD Students (Primary Advisor)..

PhD1. 09/2023 – present, Yiqing Zhang, DS.

PhD2. 12/2022 – present, Shannon Song, DS. [contributor: C1.]

PhD3. 08/2022 – 05/2023, Bright Kyeremeh, DS. *Left WPI.*

WPI MS Students Advised..

MS1. 09/2022 – 04/2023, Sirhendu Ganguly, DS.
Current employment: Founding Data Scientist, Indicator Lab (Santa Clara, CA).

MS2. 12/2022 – 04/2022, Benjamin N'yoma Diamond, DS.
Current employment: MPhil in Advanced Computer Science, University of Cambridge.

PhD Qualifier Committees..

PQual1. Himan Namdari, WPI Data Science. *Completed December 2023.* Co-advisor #2. Primary Advisor: Reza Zekavat.

PQual2. Isaac Zhao, WPI Data Science. *Completed December 2023.* Co-advisor #1. Primary Advisors: Carolina Ruiz, Sergio Alvarez (Boston College).

PQual3. Oluseun Olulana, WPI Data Science. *Completed October 2023.* Co-advisor #1. Primary Advisor: Elke Rundensteiner.

PQual4. Brian Lewandowski, WPI Computer Science. Comprehensive Exam. *Completed January 2023.* Primary Advisor: Randy Paffenroth.

PhD Dissertation Proposal Committees

PProp1. Mallak Alkhathlan, CS, "." *Completed February 2024.* Primary Advisor: Elke Rundensteiner. Co-Advisor: Lane Harrison.

PProp2. Brian Lewandowski, CS, "Using Autoencoder Feature Residuals to Improve Network Intrusion Detection." *Completed May 2023.* Primary Advisor: Randy Paffenroth.

PProp3. Ahmad Ghasemi, DS, "Resilient and Intelligent Resource Allocation in mmWave Wireless Communications." *Completed November 2022.* Primary Advisor: Reza Zekavat.

PhD Dissertation Defense Committees

PDef1. Ahmad Ghasemi, DS, "Resilient and Intelligent Resource Allocation in mmWave Wireless Communications." *Completed June 2023.* Primary Advisor: Reza Zekavat.

PDef2. Brian Lewandowski, CS, "Using Autoencoder Feature Residuals to Improve Network Intrusion Detection." *Completed August 2023.* Primary Advisor: Randy Paffenroth.

Master Thesis Defense Committees

MDef1. Kai Zhang, DS, "Knowledge Triplets Derivation from Scientific Publications via Dual-Graph Resonance." *Completed December 2023.* Primary Advisor: Xiazhong Liu.

MDef2. Grant Perkins, CS, "Pressure Injury Stage Image Classification using Cross-Shaped Window Attention Vision Transformers." *Completed December 2023.* Primary Advisor: Emmanuel Agu.

MDef3. Ryan Killea, DS, "A Level-Set Approach for Solving Nonlinear Integer Optimization Problems." *Completed July 2023.* Primary Advisor: Andrew Trapp.

Independent Studies conducted at WPI

Graduate Directed Research & Independent Study Projects

ISG1. 2024 Spring, Mehrnoush Alizade. "Advanced NLP techniques for detecting bias in health-related textual data".

ISG2. 2024 Spring, "Disparity-Aware Multi-Modal Transformer Architectures for Clinical Trial Prediction". Yiqing Zhang.

ISG3. 2023 Spring, Shannon Song. "City-scale detection of building thermal anomalies from optical images". *In collaboration with Prof. Nancy Ma (Architectural Engineering).*

ISG4. 2023 Spring, Shrishailya Chavan. "Image Classification Model to Predict Construction Year and Architectural Styles of Buildings". *In collaboration with Prof. Nancy Ma (Architectural Engineering).*

ISG5. 2023 Spring, Haiyang Yun. "Twitter Subpopulations."

Undergraduate Independent Study Projects ....

ISU1. 2022 D-Term, Jeffrey Chan. "CS4432: Database Systems II".

ISU2. 2022 D-Term, Joseph Cardarelli. "CS4432: Database Systems II".

ISU3. 2022 D-Term, Ian Wright. "CS4432: Database Systems II".

Academic Advising at WPI

UA1. Jan 2024, 55 undergraduate advisees.

UA2. Jan 2023, 46 undergraduate advisees.

Publications

Citations: 1166, h-Index: 12, i10-Index: 18; as of Jan, 17 2023 based on Google Scholar.

I have been actively publishing at prestigious venues in Social Media/Web Mining research (ASONAM, WebSci). Recently, I have also started to publish at important venues in AI/Machine Learning (AAAI, SDM). Below I have labeled top ranked venues according to Google Scholar in *Artificial Intelligence* (**top-ai**), *Computing Systems* (**top-cs**), and *Data Mining & Analysis* (**top-dm**).

In the following publication list, ^{G} denotes **graduate students** that are (co-)advised by me are in bold, ^{U} denotes **undergraduate mentees**, where WPI student co-authors are underlined.

Peer-Reviewed Conference and Workshop Proceedings ....

C1. Libby Tiderman^U, Juan Sanchez Mercedes^U, Fiona Romanoschi^U, **Fabricio Murai**, "Towards Detecting Cascades of Biased Medical Claims on Twitter". *IEEE MIT Undergraduate Research Technology Conference* (*URTC 2023*). 5 pages. (Shannon Song^G would have been listed as co-author if allowed by the conference.)

C2. Julio C. S. Reis, Philipe Melo, Fabiano Belém, **Fabricio Murai**, Jussara M. Almeida, Fabricio Benevenuto, "Helping Fact-Checkers Identify Fake News Stories Shared through Images on WhatsApp". *Brazilian Symposium on Multimedia and the Web* (*WebMedia'23*). 14 pages. (*invited paper*).

C3. Pedro Henrique Barros^G, Heitor Ramos, **Fabricio Murai**. "Bayes and Laplace versus the world: A new label attack approach in federated environments based on Bayesian Neural Networks". *Brazilian Conference on Intelligent Systems* (*BRACIS'23*). 15 pages.

C4. Samuel Guimarães, Gabriel Kakizaki, Philipe Melo, Márcio Silva, **Fabricio Murai**, Julio Reis, Fabricio Benevenuto. "Anatomy of Hate Speech Datasets: Composition Analysis and Cross-dataset Classification." *ACM Conference on Hypertext and Social Media* (*HT'23*). 11 pages, acceptance rate: 28.0%.

C5. Jackson de Faria^G, Renato Assunção, **Fabricio Murai**. "Fisher Scoring Method for Neural

Networks Optimization." *SIAM International Conference on Data Mining (SDM'23)*. 9 pages, acceptance rate: 27.4%. **top-dm**

C6. Henrique S. Assumpção[U], Fabrício Souza, Leandro L. Campos[G], Vinícius T. C. Pires, Paulo M. L. de Almeida, **Fabricio Murai**. "DELATOR: Money Laundering Detection via Multi-Task Learning on Large Transaction Graphs." *IEEE International Conference on Big Data (BigData'22)*, *short*. 6 pages, full+short acceptance rate: 37.8%. **top-dm**

C7. Renan S. Saldanha, José M. Rosa, Carlos H. G. Ferreira, Gabriel Nobre, **Fabricio Murai**, Jussara Almeida. "Uncovering Coordinated Communities on Twitter During the 2020 U.S. Election." *IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM'22)*. 8 pages, acceptance rate: 19.6%. **top-dm**

C8. José M. Rosa, Renan S. Saldanha, Carlos H. G. Ferreira, Gabriel Nobre, **Fabricio Murai**, Jussara Almeida. "Uncovering Discussion Groups on Claims of Election Fraud from Twitter." *International Conference on Social Informatics (SocInfo'22)*. 15 pages, acceptance rate: 20.2%.

C9. Daniel Mello[G], Renato Assunção, and **Fabricio Murai**. "Top-Down Deep Clustering with Multi-generator GANs." *AAAI Conference on Artificial Intelligence (AAAI'22)*. 11 pages, acceptance rate: 15%. **top-ai**

C10. Rafael Sales Medina[G], Ana Paula Couto da Silva, **Fabricio Murai**, "Risk Perception and Misinformation in Brazilian Twitter during COVID-19 Infodemic". *IEEE International Conference on Social Computing and Networking (SocialCom'22)*. 8 pages.

C11. Karen B. Enes[G], Matheus Nunes, **Fabricio Murai**, Gisele L. Pappa. "Evolving node embeddings for dynamic exploration of network topologies." *Ibero-American Conference on Artificial Intelligence (IBERAMIA'22)*. 8 pages.

C12. Bruno Guilherme Gomes[G], **Fabricio Murai**, Olga Goussevskaia, and Ana Paula da Silva. "Mixture Variational Autoencoder of Boltzmann Machines for Text Processing". *Natural Language Processing and Information Systems (NLDB'21)*. 11 pages, acceptance rate: 23%.

C13. Bruno Guilherme Gomes[G], **Fabricio Murai**, Olga Goussevskaia, and Ana Paula da Silva. "Sequence-Based Word Embeddings for Effective Text Classification." *Natural Language Processing and Information Systems (NLDB'21)*. 11 pages, acceptance rate: 23%.

C14. Davi Pedrosa de Aguiar[G] and **Fabricio Murai**. "Encoding Physical Conditioning from Inertial Sensors for Multi-step Heart Rate Estimation". *Brazilian Conference on Intelligent Systems (BRACIS'21)*. 15 pages, acceptance rate: 40%.

C15. Carlos Henrique Gomes Ferreira[G], **Fabricio Murai**, Ana Paula da Silva, Jussara Marques de Almeida, Martino Trevisan, Luca Vassio, Idilio Drago, and Marco Mellia. "Unveiling Community Dynamics on Instagram Political Network." *ACM Conference on Web Science (WebSci'20)*. 10 pages, acceptance rate: 26%.

C16. Lucas Lima, Julio C S Reis, Philipe Melo, **Fabricio Murai**, and Fabrício Benevenuto. "Characterizing (Un)moderated Textual Data in Social Systems." *IEEE/ACM International Conference*

on Advances in Social Networks Analysis and Mining (*ASONAM'20*), *short*. 5 pages, full+short acceptance rate: 37%. **top-dm**

C17. Julio C S Reis, André Correia, **Fabricio Murai**, Adriano Veloso, and Fabrício Benevenuto. "Explainable machine learning for fake news detection." *ACM Conference on Web Science* (*WebSci'19*). 10 pages, acceptance rate: 32%.

C18. Martino Trevisan, Luca Vassio, Idilio Drago, Marco Mellia, **Fabricio Murai**, Flavio Figueiredo, Ana Paula da Silva, and Jussara M Almeida. "Towards Understanding Political Interactions on Instagram." *ACM Conference on Hypertext and Social Media* (*HT'19*), *short*. 5 pages, acceptance rate: 29%.

C19. Marco Lattuada, Eugenio Gianniti, Marjan Hosseini, Danilo Ardagna, Alexandre Maros, **Fabricio Murai**, Ana Couto da Silva, and Jussara Almeida. Gray-Box Models for Performance Assessment of Spark Applications. *International Conference on Cloud Computing and Services Science* (*CLOSER'19*). 10 pages.

C20. Alexandre Maros, **Fabricio Murai**, Ana Paula da Silva, Jussara M. Almeida, Marco Lattuada, Eugenio Gianniti, Marjan Hosseini, and Danilo Ardagna. "Machine Learning for Performance Prediction of Spark Cloud Applications." *IEEE International Conference on Cloud Computing* (*CLOUD'19*). 8 pages, acceptance rate: 20.8%.

C21. Bárbara Silveira Fraga[G], Ana Paula da Silva, and **Fabricio Murai**. "Online Social Networks in Health Care: A Study of Mental Disorders on Reddit". *IEEE/WIC/ACM International Conference on Web Intelligence* (*WI'18*), *short*. 6 pages.

C22. Francisco Galuppo Azevedo[U], Bruno Demattos Nogueira[U], **Fabricio Murai**, and Ana Paula C. Silva. "Estimation Errors in Network A/B Testing Due to Sample Variance and Model Misspecification". *IEEE/WIC/ACM International Conference on Web Intelligence* (*WI'18*), *short*. 6 pages.

C23. Karen Braga Enes[G], Pedro Paulo Valadares Brum, Tiago Oliveira Cunha, **Fabricio Murai**, Ana Paula da Silva, and Gisele Lobo Pappa. "Reddit Weight Loss Communities: Do They Have What It Takes for Effective Health Interventions?" *IEEE/WIC/ACM International Conference on Web Intelligence* (*WI'18*), *short*. 6 pages.

C24. Lucas Lima, Julio C S Reis, Philipe Melo, **Fabricio Murai**, Leandro Araujo, Pantelis Vikatos, and Fabricio Benevenuto. "Inside the Right-Leaning Echo Chambers: Characterizing Gab, an Unmoderated Social System." *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining* (*ASONAM'18*). 8 pages, acceptance rate: 15%.

C25. Levy de Souza Silva, **Fabricio Murai**, Ana Paula Couto da Silva, and Mirella M Moro. "Automatic Identification of Best Attributes for Indexing in Data Deduplication." *Alberto Mendelzon International Workshop on Foundations of Data Management* (*AMW'18*). 10 pages.

C26. **Fabricio Murai**, Bruno Ribeiro, Donald Towsley, and Krista Gile. "Characterizing Branching Processes from Sampled Data." *Annual Workshop on Simplifying Complex Networks for Practitioners* (*SIMPLEX@WWW'13*). 7 pages.

C27. Bruno Ribeiro, Pinghui Wang, **Fabricio Murai**, and Don Towsley. "Sampling directed graphs with random walks." *IEEE International Conference on Computer Communications* (*INFOCOM'12*). 9 pages, acceptance rate: 18%.

C28. **Fabricio Murai**, and Daniel Ratton Figueiredo. "Assortative Mixing in BitTorrent-Like Networks." *IEEE INFOCOM Student Workshop@INFOCOM'09* (poster). 2 pages.

Peer Reviewed Journals

J1. Karen B. Enes, Matheus Nunes, **Fabricio Murai**, Gisele L. Pappa. Temporally-aware node embeddings for evolving networks topologies. *AI Communications*, 2024.

J2. Nan Ma, Qi Zhang, **Fabricio Murai**, William W. Braham, Holly W. Samuelson. Learning building occupants' indoor environmental quality complaints and dissatisfaction from text-mining Booking.com reviews in the United States. *Building and Environment*, 2023. **IF: 7.4.**

J3. Carlos H. G. Ferreira, **Fabricio Murai**, Ana P. C. Silva, Martino Trevisan, Luca Vassio, Idilio Drago, Marco Mellia, and Jussara M. Almeida. On Network Backbone Extraction for Modeling Online Collective Behavior. *PLOS ONE*, 2022. **IF: 3.24.**

J4. Eduarda T. C. Chagas, Pedro H. Barros, Isadora Cardoso-Pereira, Igor V. Ponte, Pablo Ximenes, Flávio Figueiredo, **Fabricio Murai**, Ana Paula Couto da Silva, Jussara M. Almeida, Antonio A. F. Loureiro, and Heitor S. Ramos. "Effects of Population Mobility on the COVID-19 Spread in Brazil." *PLOS ONE*, 2021. **IF: 3.24.**

J5. Bárbara Silveira^G, Henrique S Silva^U, **Fabricio Murai**, and Ana Paula C da Silva. "Predicting user emotional tone in mental disorder online communities." *Future Generation Computer Systems*, 2021. **top-cs, IF: 7.187.**

J6. Carlos H G Ferreira^G, **Fabricio Murai**, Ana P C Silva, Jussara M Almeida, Martino Trevisan, Luca Vassio, Marco Mellia, and Idilio Drago. "On the dynamics of political discussions on Instagram: A network perspective." *Online Social Networks and Media*, 2021. **top-dm, IF: 4.419.**

J7. Francisco Galuppo Azevedo^U and **Fabricio Murai**. "Evaluating the state-of-the-art in mapping research spaces: A Brazilian case study." *PLOS ONE*, 2021. **IF: 3.24.**

J8. Carlos Henrique Gomes Ferreira^G, **Fabricio Murai**, Breno de Sousa Matos^U, and Jussara M Almeida. "Modeling Dynamic Ideological Behavior in Political Networks." *The Journal of Web Science*, 2019.

J9. **Fabricio Murai**, Bruno Ribeiro, Don Towlsey, and Pinghui Wang. "Characterizing Directed and Undirected Networks via Multidimensional Walks with Jumps." *ACM Trans. Knowl. Discov. Data*, 2019. **top-dm, IF: 2.713.**

J10. Julio C S Reis, André Correia, **Fabricio Murai**, Adriano Veloso, and Fabrício Benevenuto. "Supervised Learning for Fake News Detection." *IEEE Intelligent Systems*, 2019. **306 citations, IF: 6.744.**

J11. **Fabricio Murai**, Diogo Rennó[G], Bruno Ribeiro, Gisele L Pappa, Don Towsley, and Krista Gile. "Selective harvesting over networks." *Data Mining and Knowledge Discovery*, 2018. **top-dm, IF: 5.406.**

J12. **Fabricio Murai**, Bruno Ribeiro, Don Towsley, and Pinghui Wang. "On Set Size Distribution Estimation and the Characterization of Large Networks via Sampling." *IEEE Journal on Selected Areas in Communications*, 2013. **IF: 13.081.**

J13. **Fabricio Murai**, Antonio A de A. Rocha, Daniel R Figueiredo, and Edmundo A de Souza e Silva. "Heterogeneous download times in a homogeneous BitTorrent swarm." *Computer Networks*, 2012. **IF: 6.708.**

Technical Reports and Non-Archival Workshops Papers...................................

P1. Shiri Dori-Hacohen, Roberto Montenegro, **Fabricio Murai**, Scott Hale, Keen Sung, Michela Blaine and Jennifer Edwards-Johnson. "Fairness via AI: Bias Reduction in Medical Information." *FAccTRec Workshop on Responsible Recommendation at RecSys*, 2021. 4 pages, *arxiv:2109.02202*.

P2. Davi Pedrosa de Aguiar[G] and **Fabricio Murai**. "Encoding physical conditioning from inertial sensors for multi-step heart rate regression." *ACM Conference on Health, Inference, and Learning (CHIL) Workshop*, 2021 (poster). *arXiv:2103.12095*.

P3. **Fabricio Murai**, Bruno Ribeiro, Donald Towsley, and Krista Gile. "Targeted Network Recruitment on a Budget." *NetSci*, 2014 (poster).

Fellowship and Grants

In Preparation / Pending...

PG1. **Principal Investigator**, "Enhancing Quality and Equity of EHR CVD Risk Information in Primary Care Settings of Underserved Populations via AI/ML ". NIH. (in preparation)

PG2. **Senior Personal**, "REU: Applied AI for Advanced Applications". NSF.
Amount: \$462,210 over 3 years (submitted Sep 2023, pending)

Awarded...

AG1. **Senior Personal**, "Quantifying Uncertainty in Adversarial Federated Learning". FAPESP (São Paulo Research Foundation), Brazil.
PI: Heitor Ramos (UFMG).
Amount: approx. \$45,156* over 2 years. (08/01/2023 – 07/31/2025, [funded])
Senior Personnel: Alejandro Cesar Frery Orgambide (WGTN), Amir Houmansadr (UMass Amherst), Antonio Alfredo Ferreira Loureiro (UFMG), Leandro Aparecido Villas (UNICAMP).
* R\$ 219,910 (currency exchange 4.87, as of 01/11/2023)

AG2. **Collaborator**, "FAI: BRIMI - Bias Reduction in Medical Information". NSF Division of Information and Intelligent Systems. Award number 2147305
Amount: \$629,000 over 3 years (Mar 2022 – Feb 2025, [funded])

Percentage of funding responsible: non-applicable.
UConn: Shiri Dori-Hacohen (PI), Sherry Pagoto (Co-PI)
Meedan: Scott Hale (Co-PI)

Denied

DG1. **Principal Investigator**, "Racial-ethnic disparities in the diet-obesity relationship: moderation by food insecurity and environmental social determinants of health". NIH (AIM-AHEAD).
Amount: $244,338 over 2 years (submitted Jun 2023, denied)

DG2. **Principal Investigator**, "Robust Node Representations for Partially Observed Graphs". Google Research Academic Awards.
Amount: approx. $60,000 over 1 year (submitted Dec 2022, denied)

Previous Awards

PreG1. **Co-PI**, "Science Support Program: WildPixels: Dense Labeling of Remote Sensing Images in the Wild". Serrapilheira Institute. Competitive, 12 awarded/505.
Amount: $98,050 over 3 years (Aug 2021 – Jul 2024)
Percentage of funding responsible: non-fixed.
UFMG (Brazil): Jefersson dos Santos (PI), Heitor Ramos (Co-PI)

PreG2. **Coordinator** (until Aug 2022), "(Training) Artificial Intelligence Applied to Geosciences Course". PETROBRAS. State-owned industry.
Amount: $211,052 over 3 years (Jan 2021 – Dec 2023; one 10-week course/year)
Percentage of funding responsible: 66.7%.

PreG3. **Coordinator** (until Aug 2022), "(Training) Techonological Residency in Data Science". Usiminas. Private.
Amount: $83,795 (Sep 2021 – Dec 2022)
Percentage of funding responsible: 75.0%.

PreG4. **Principal Investigator**, "Artificial Intelligence for Automatic Detection of Evidences of Money Laundering and Terrorist Financing". Inter Bank (InterMINDS Research Lab), private.
Amount: $23,925 (Aug 2021 – Feb 2022)
Percentage of funding responsible: 100.0%.

PreG5. **Collaborator**, "Machine Learning System for Predictive Maintenance.". Minasligas (R&D, federal support via EMBRAPII).
Amount: $91,515 (Oct 2020 – Jun 2021)
Percentage of funding responsible: not applicable.

PreG6. **Collaborator**, "ATMOSPHERE - Adaptive, Trustworthy, Manageable, Orchestrated, Secure, Privacy-assuring, Hybrid Ecosystem for REsilient Cloud Computing." European Union (Cooperation Programme, H-2020). EU-Brazil, competitive.
Amount: €1,102,849 over two years (Nov 2017 – Oct 2019)
Percentage of funding responsible: not applicable.

PreG7. **Collaborator**, "Artificial Intelligence for Spotting Fake Profiles and Anomalous Users' Behaviors on the Web." Compagnia di San Paolo. Internationalization, Competitive.
Amount: €47,386 over one year (Jul 2018 – Jun 2019)
Percentage of funding responsible: not applicable.
UFMG (*Brazil*): Ana Paula C. da Silva (PI)
Politecnico di Torino (*Italy*): Marco Mellia (PI)

Professional Presentations

PP1. Talk at Department of Computer Science, Purdue University, West Lafayette, IN, "Fisher Scoring Method for Neural Networks Optimization ", 2023.

PP2. SIAM International Conference on Data Mining (SDM'23), Minneapolis, MN, "Fisher Scoring Method for Neural Networks Optimization ", 2023.

PP3. CS/DS Colloquium, WPI, Worcester, MA, "Harnessing the Power of Digital Platforms: a Networked Data Perspective", 2022.

PP4. Online Seminars, Institute of Computing, UFF, Brazil: "How to use graphs to analyze political communities on Instagram and science in Brazil?", 2021.

PP5. Computing Summer School, Belo Horizonte, Brazil: "Who hid my graph? Inference from partially observed networks", 2020.

PP6. Statistics Seminar, Dept. of Statistics, UFMG, Brazil, "Reasoning from Partially Observed Networks: Sampling, Estimation and Models", 2019.

PP7. SmartData Research Group Seminar, Politecnico di Torino, Italy, "Reasoning from Partially Observed Networks: Sampling, Estimation and Models", 2018.

PP8. Computing Summer School, Belo Horizonte, Brazil, "Network Science: mathematics and algorithms", 2018.

PP9. REU Lunch Series, UMass Amherst, "Data Science for Networks", 2016.

Professional Societies Memberships

PS1. Association for Computing Machinery, Member.

PS2. Society for Industrial and Applied Mathematics, Member.

Editorial and Referee Activities

Program Committee..

PC1. AAAI Conference on Web and Social Media (ICWSM): 2022

PC2. ACM Knowledge Discovery and Data Mining Conference (KDD): 2019, 2020, 2021, 2023

PC3. European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD): 2021, 2022

PC4. The Web Conference (WWW): 2021, 2022, 2023

PC5. IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT): 2018, 2020

PC6. IEEE International Conference on Computer Communications (INFOCOM): 2019, 2020[1], 2021[1,2].
[1] *Distinguished TPC Member in 2020 (20.5%) and 2021 (20.8%);* [2] *Session Chair.*

PC7. CSBC Workshop on Computer and Communication Systems Performance: (WPerformance) 2017-2020

Conference Reviewing

R1. International Conference on Learning Representations (ICLR): 2024

R2. Conference on Neural Information Processing Systems (NeurIPS): 2023

Journal Reviewer

JR.1 IEEE Transactions on Neural Networks and Learning Systems (TNNLS): 2022

JR.2 IEEE Transactions on Knowledge and Data Engineering (TKDE): 2021

JR.3 IEEE Access: 2020, 2021

JR.4 ACM Transactions on Knowledge Discovery from Data (TKDD): 2020, 2021

JR.5 ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS): 2018, 2019

JR.6 Computer Networks: 2020

JR.7 Data & Knowledge Engineering (DKE): 2021

JR.8 Information Processing & Management (IP&M): 2020, 2021, 2022 2023

JR.9 Information Systems: 2017

JR.10 Journal of Information and Data Management (JIDM): 2023

JR.11 Brazilian Journal of Probability and Statistics (BJPS): 2021

JR.12 Journal of Network and Systems Management (JoNS): 2017

Honors, Awards and Recognition related to Scholarship

HS1. Distinguished TPC Member for 2 years in a row: 2020 (20.5%), 2021 (20.8%),
IEEE International Conference on Computer Communications (INFOCOM).
This distinction is awarded based upon ratings by peer TPC members, fairness in review scores, and promptness in meeting various deadlines during the review process.

HS2. Full Ph.D. Fellowship (*awarded*, single one awarded to CS in Brazil/2011), Brazilian National Research Council (CNPq), 2011-2015

HS3. Full Ph.D. Fellowship (*declined*, rank: 1st in STEM fields in Brazil/2011), Brazilian Graduate Council of the Ministry of Education (CAPES)

HS4. M.S. Scholarship "Grade A Student" (2 awarded/year in the graduate program), Rio de Janeiro State Research Support Funding Agency, Brazil, 2009-2010

HS5. M.S. Scholarship, Brazilian National Research Council (CNPq), 2008-2009

HS6. Distinguished Ph.D. Candidate (2 awarded/year), CICS UMass Amherst, 2014

HS7. Outstanding Synthesis* Award, (2 awarded/year), CICS UMass Amherst, 2014. Amount: $300. Sponsored by Yahoo! *The Synthesis is a significant research project that combines two different research fields; can be used as M.S. Dissertation.*

HS8. Graduated with honors (*magna cum laude*), 2007

Service to Profession

Conference Organizing Committee..

SP1. CSBC Workshop on Computer and Communication Systems Performance (WPerformance, Brazil's premier event on Perf. Evaluation), General Co-Chair: 2022.

SP2. Co-Chair, Computing Summer School, organized by UFMG, targeted at regional undergraduate students: 2019-2020.

Department and WPI Committee and Administrative Assignments

DC1. Faculty Search Committee Member (+ Diversity Advocate), AI Program: 2023-2024

DC2. Arts and Sciences Inclusion Representative, Computer Science: 2023-2024

DC3. DEI Committee, Computer Science: 2022-2023 (Member), 2023-2024 (Chair)

DC4. DEI Committee Member, Data Science: 2022-2023, 2023-2024

DC5. DEI Committee Member, Computer Science: 2022-2023

DC6. DS WPI Undergraduate Research Showcase Judge: 2023

DC7. DS Project Presentation Day Judge: 2023

DC8. CS Project Presentation Day Judge: 2023

DC9. Graduate Research Innovation Exchange (GRIE) Judge (1st & 2nd rounds): 2023

DC10. Faculty Activity Model (FAM) Committee, Data Science: 2023

DC11. IQP Presidential Awards Reader: 2022

Service to students at WPI

SS1. Brazilian Student Association (BRASA) Club Co-Advisor, 2022-2023, 2023-2024

SS2. Data Science Club Advisor, 2022-2023, 2023-2024

Honors, Awards and Recognition (other)

HO1. Outstanding Faculty Award, WPI Data Science (nominated by students), 2023.

Graduate Committees outside WPI

PhD Dissertation Committees

OPD1. External: Ronald Chiesse de Souza (Systems & Comp. Eng., UFRJ, Daniel Figueiredo), 2023.

OPD2. External: Edemir F. de Andrade Jr. (Computer Science, UFMG, Jefersson dos Santos), 2023.

OPD3. External: João Ismael Pinheiro (Informatics, UFRJ, Daniel Menasche), 2021.

OPD4. Julio Cesar Soares dos Reis (CS, Fabricio Benevenuto), 2020.

PhD Proposal Committees

OPP1. External: Ronald Chiesse de Souza (Systems & Comp. Eng., UFRJ, Daniel Figueiredo), 2021.

OPP2. Julio Cesar Soares dos Reis (CS, Fabricio Benevenuto), 2019.

OPP3. Rodrigo de Magalhães Silva (CS, Marcos Gonçalves), 2019.

OPP4. Edemir Ferreira de Andrade Junior (CS, Jefersson Alex dos Santos), 2019.

Thesis-based MS Students

OMS1. Gustavo Germano (UFMG, Mar 2020 – Aug 2023). Dissertation: *Hypergraph Representation Learning for Link Prediction from Instagram Multi-Commenter Interactions*.

OMS2. Jackson de Faria (Murai was co-advisor with Assunção, Aug 2019 – Jul 2023). Dissertation: *Fisher Scoring Method for Neural Networks Optimization*. Current employment: PhD student at Simon Fraser University.

OMS3. Leandro Campos (Co-advisor Valle, Mar 2019 – Jul 2022). Dissertation: *A Generative Approach for for Multi-Step Prediction*. Current employment: AI Researcher at InterMINDS (Inter Bank).

OMS4. Bruno Gomes (Murai was co-advisor with da Silva and Goussevskaia, Mar 2018 – Nov 2021). Dissertation: *Efficient Natural Language Processing: Two Frameworks for Text Classification and Analysis.* Current employment: ML Research Engineer at Rocketmat.

OMS5. Ronald Pereira (UFMG, Aug 2019 – Oct 2021). Senior Data Scientist at iFood. Dissertation: *Automatic Detection of Frauds in Financial Transactions Networks using Graph Learning*. Current employment: Data Science Specialist at iFood.

OMS6. Daniel Mello (Murai was Co-advisor with R. Assunção, Aug 2018 – May 2021). Applying to PhDs. Dissertation: *Generative Adversarial Networks for Hierarchical Clustering*. Current employment: PhD student at Purdue.

OMS7. Davi Pedrosa de Aguiar (UFMG, Mar 2019 – Apr 2021). Dissertation: *Predicting Heart Rate During Physical Activities Using Artificial Neural Networks.* Current employment: Software Engineer at Treinus.

OMS8. Bárbara Silveira (Murai was Co-advisor with A. P. C. da Silva, Mar 2017 – Nov 2019). Dissertation: *Characterizing and Predicting User Emotional Tone in Mental Health Disorder Online Communities.* Current employment: Tech Lead at A3Data, Lecturer for MBA courses at PUC-Minas.

OMS9. Rafael Sales Medina Ferreira (Co-advisor: A. P. C. da Silva, Mar 2017 – May 2019). Dissertation: *Impact of Online Social Communities in Language Learning.* Current employment: Microsoft.

MS Thesis Committees..

OMT1. Osmani (CS, Lourenço), 2023.

OMT2. Renan Cordeiro Lima (CS, Rodrygo Santos), 2023.

OMT3. External Member: Caio Lorenzetti Martinelli (CS, Denis Deratani Mauá), 2023.

OMT4. External Member: Caio Truzzi Lente (CS, Roberto Hirata Jr.), 2023.

OMT5. Marcos Felipe Vendramini Carvalho (CS, Jefersson Alex dos Santos), 2021.

OMT6. Matheus Henrique do Nascimento Nunes (CS, Gisele Pappa), 2021.

OMT7. Gabriel Peres Nobre (CS, Jussara Almeida), 2021.

OMT8. Pedro Dalla Vecchia (CS, Rodrygo Santos), 2021.

OMT9. Filipe Barreto do Nascimento (CS, Rodrygo Santos), 2021.

OMT10. External Member: Lucas Lopes Felipe (Informatics, UFRJ, Daniel Menasche), 2021.

OMT11. Wesley Henrique Silva Pereira (Statistics, Denise Duarte), 2020.

OMT12. Mariana Alves Amorim (Statistics, Denise Duarte), 2020.

OMT13. Alexandre Maros (CS, Jussara Almeida), 2019.

OMT14. Túlio Braga Moreira Pinto (CS, Jussara Almeida), 2019.

OMT15. Tulio Lima Criscuolo (CS, Wagner Meira Jr. and Renato Assunção), 2019.

OMT16. Caio Cesar Viana da Silva (CS, Jefersson dos Santos), 2019.

OMT17. Lucas Henrique Costa de Lima (CS, Fabricio Benevenuto), 2019.

OMT18. Gabriel Lage Calegari (CS, Ana Paula da Silva), 2019.

OMT19. Tiago Pimentel Martins da Silva (CS, Adriano Veloso), 2018.

OMT20. Luis Fernando Miranda (CS, Gisele Pappa), 2018.

OMT21. Johnnatan Messias Peixoto Afonso (CS, Fabricio Benevenuto), 2017.

MS Proposal Committees..

OMP1. External Member: Caio Lorenzetti Martinelli (CS, USP, Denis Deratani Mauá), 2022.

OMP2. External Member: Caio Lente (CS, USP, Roberto Hirata Jr.), 2021.

OMP3. Wesley Henrique Silva Pereira (Statistics, Denise Duarte), 2019.

OMP4. Mariana Alves Amorim (Statistics, Denise Duarte), 2019.