Diego Da Silva, PhD

1505-55 Bloor Street East
Toronto, ON, Canada M4W 3W6
(+1) 437-217-1278

August 21, 2025

dluiz.silva@utoronto.ca
in /diegosilva

Education

PhD in Computer Science - Scientific and Applied Computing   Santo Andre, SP, Brazil
Federal University of ABC (UFABC)   *2016 - 2021*

- Dissertation: *A Method for Finding Factors Affecting the Service Reliability on Fixed Bus Routes* (Supervisor: Dr. Raphael Yokoingawa de Camargo/Center for Mathematics, Computing and Cognition).

International Visiting Graduate Student   Toronto, ON, Canada
University of Toronto   *2019 - 2021*
Diploma in Industrial Management   Sao Paulo, SP, Brazil
Polytechnic School of the University of Sao Paulo (USP)   *2007 - 2009*
BSc Science & Technology   Santo Andre, SP, Brazil
Federal University of ABC (UFABC)   *2007 - 2012*
BSc Civil Construction   Sao Paulo, SP, Brazil
Sao Paulo State University (Unesp/Fatec-SP)   *2002 - 2006*

Academic Employment

Postdoctoral Fellow   Toronto, ON, Canada
University of Toronto/Transit Analytics Lab   *April 2021 - Present*

- Working to benchmark, simulate, model, optimize and analyze urban transit systems, including reliability and decision-making processes.

- Using machine learning methods to analyze the impact of electric buses on transit planning and operation.

- Advanced time series models for forecasting demand and estimating Origin-Destination matrix using Toronto subway Wi-Fi data.

- Writing proposals for research partnership funding for federal government agencies and private companies, securing resources for innovative transit research and development projects.

- Organizing and supported events such as symposiums, research days, and conferences, fostering collaboration and knowledge exchange among academics, industry professionals, and policymakers.

- Leading the research delivery on Generative Design of Integrated Transportation Networks in the iCity 2.0 Project. This initiative aims to bring together academia, government, and industry to collaborate on Urban Data Science for Future Mobility. Our objective is to develop a new capability that employs generative design to discover the most effective surface transit service and network solutions, and identify optimal strategies for improving them in an Ontario case study. The Principal Investigator is Dr. Eric J. Miller. Ontario Research Fund: 4,000,000 CAD

- Evaluating the application of an On-Demand Transit (ODT) planning and assessment framework in collaboration with MiWay Transit - Mississauga.

- Development of Transit Solutions Web Apps deployed in the cloud. Examples: TALe-Bus solution to help Transit Agencies transition from diesel to electric fleet by calculating the replacement factor per route; FEAT (The Fare Equity and Access Tool) a tool to calculate the Transit Disparity Ratio to identify spatial clusters of areas with high fare disparity and their correlations with other variables such as income or status as an essential worker and learn about how the urban morphology might affect the design and service capabilities of the transit system.

- Managed the 2025 Public Transit Short Courses and lectured on data analytics for reliability and accessibility analysis. He also taught the theoretical basis for using transit data and facilitated hands-on activities using cloud notebooks written in Python.

Teaching Experience

2025 Public Transit Short Courses   Toronto, ON, Canada
University of Toronto   *August 2025*

- Delivered advanced training in transit data analytics and intelligent transportation systems (ITS), combining lectures with hands-on Python labs using real-world datasets; integrated AI-driven tools and practical transit planning perspectives to build participant expertise in data analysis, coding, and system planning.

Analytics for Transit and Mobility Networks (CIV1507)   Toronto, ON, Canada
University of Toronto   *Summer 2024 and 2025*

- Developed and taught a unique graduate-level course that brings the most advanced techniques applied in public transit, including AI models and advanced time series analysis. The course emphasizes data analysis, modeling, and visualization principles, with applications in transit reliability, equity and access to opportunities, demand forecasting, and real-time data analysis. The course received positive student evaluations, scoring 4.5 out of 5 in 2024. This score exceeded the department average of 4.2 and the Applied Sciences and Engineering division average of 4.3 for the same year.

Research Contracts

Getulio Vargas Foundation (FGV - Brazil)   Toronto, ON, Canada
Transit Network Redesign   *May 2024 - June 2025*

- Supporting strategic technical decision-making in Intelligent Transport Systems and advanced data analysis. Responsibilities include updating and restructuring the metropolitan network modeling and public passenger transport systems for the Porto Alegre Metropolitan Region. A key goal is to develop a comprehensive bid for implementing these technological improvements. This $1M USD project is led by Principal Investigator Dr. Ciro Biderman under Contract SECON N° 22343/2023.

Getulio Vargas Foundation (FGV - Brazil)   Toronto, ON, Canada
Automated Fare Collection and ABT System Design   *May 2023 - June 2024*

- Designed the technical and functional architecture for transitioning from a closed-loop to an open-loop payment system with Account-Based Ticketing (ABT) services for EPTC in Porto Alegre, Brazil. This $390K USD project, led by Principal Investigator Dr. Ciro Biderman under Contract SECON N° 82352/2023, aimed to modernize fare collection systems and enhance passenger experience.

Getulio Vargas Foundation (FGV - Brazil)   Toronto, ON, Canada
Big Data for Sustainable Urban Development   *March 2021 - August 2021*

- Collaborated with the Getulio Vargas Foundation (FGV-Brazil), Inter-American Development Bank (IDB), and Waze to develop a city-to-street-level congestion indicator. Designed and implemented a real-time traffic monitoring dashboard for São Paulo (Brazil), Montevideo (Uruguay), Quito (Ecuador), Xalapa (Mexico), and Miraflores (Peru). This initiative was part of the "Big Data for Sustainable Urban Development" project, led by Principal Investigator Dr. Ciro Biderman, to enhance urban mobility and decision-making through advanced data analytics.

TransitCenter (USA)   Toronto, ON, Canada
TransitCenter Equity Dashboard   *March 2020 - February 2021*

- Contributed to a $100K USD project led by Prof. Alex Karner, focusing on comprehensive transit access and equity analysis across seven U.S. major urban areas. Led the technical development and created a Python-based Fare Calculator system, a key component of the transit access score calculation, to support equity-focused transit planning.

Academic Contributions

Peer-Reviewed Journal Publications

A1 **Da Silva, D.**, Klumpenhouwer, W., Karner, A., Robinson, M., Liu, R., and Shalaby, A. (2022). Living on a Fare: Modeling and Quantifying the Effects of Fare Budgets on Accessibility and Equity. *Journal of Transport Geography* 101, p. 103348.

A2 Klumpenhouwer, W., Allen, J., Li, L., Liu, R., Robinson, M., **Da Silva, D.**, Farber, S., Karner, A., Rowangould, D., Shalaby, A., Buchanan, M., and Higashide, S. (2021). A Comprehensive Transit Accessibility and Equity Dashboard. *Findings* (July).

A3 Chen, R., Shalaby, A., and **Da Silva, D.**, (2024). Trends in Toronto's Subway Ridership Recovery: An Exploratory Analysis of Wi-Fi Records. Transportation Research Record, 0(0).

A4 **Da Silva, D.**, Shalaby, A. (2024) Forecasting Short-Term Subway Passenger Flow Using Wi-Fi Data Comparative Analysis of Advanced Time-Series Methods. *Journal of Intelligent Transportation Systems.*

A5 Othman, K., Ahmed, S., **Da Silva, D.**, Shalaby, A., Abdulhai, B. (2024). Decision Support Tools for Effective Bus Fleet Electrification: Replacement Factors and Fleet Sizing Prediction. *Transportation Research Interdisciplinary Perspectives.*

A6 Othman, K., **Da Silva, D.**, Shalaby, A., Abdulhai, B. (2024). Interpretable Machine Learning Models for Predicting Ebus Battery Consumption Rates in Cold Climates with and without Auxiliary Heating. *Green Energy and Intelligent Transportation.*

Peer-Reviewed Journal Publications Under Review

AR1 **Da Silva, D.**, Elsaid, F., Shalaby, A. Constructing Origin-Destination Matrix using Wi-Fi and AFC Data. *Transportation (Under Review).*

Peer-Reviewed Conference Publications

B1 Chen, R., Shalaby, A., **Da Silva, D.** (2024). Trends in Toronto's Subway Ridership Recovery: An Exploratory Analysis of Wi-Fi Records. In *Proceedings of the 103rd Transportation Research Board*. Washington, DC. 32 pages.

Peer-Reviewed Conference Presentations

C1   **Da Silva, D.**, Morais, M., Camargo, R. Y. (2025). Strategies for implementing Open Data Technology in Public Transportation: a case study in Porto Alegre, Brazil. *10th International Workshop and Symposium on Research and Applications on the Use of Passive Data from Public Transport (TRANSIT DATA)*. Kyoto, Japan.

C2   Esfeh, M. A., **Da Silva, D.**, Shalaby, A., Miller, E. (2025). Metro system vulnerability: Understanding factors affecting the severity of disruptive events. *16th International Conference on Advanced Systems in Public Transport (CASPT2025)*. Kyoto, Japan.

C3   Othman, K.,**Da Silva, D.**, Hamed, S., Shalaby, A., Abdulhai, B. (2024). Decision Support Tools for Effective Bus Fleet Electrification: Replacement Factors and Fleet Sizing Prediction. *104th Annual Meeting of the Transportation Research Board*. Washington, DC.

C4   **Da Silva, D.**, Shalaby, A. (2024). Forecasting Short-Term Subway Passenger Flow Using Wi-Fi Data Comparative Analysis of Advanced Time-Series Methods. *103rd Annual Meeting of the Transportation Research Board*. Washington, DC.

C5   Othman, K.,**Da Silva, D.**, Shalaby, A., Abdulhai, B. (2024). Data-Driven Prediction of e-Bus Battery Consumption Rates Using Machine Learning Techniques in the Canadian Environment. *103rd Annual Meeting of the Transportation Research Board*. Washington, DC.

C6   R Chen, A Shalaby, **Da Silva, D.** (2024). Trends in Toronto's Subway Ridership Recovery: An Exploratory Analysis of Wi-Fi Records. *103rd Annual Meeting of the Transportation Research Board*. Washington, DC.

C7   **Da Silva, D.**, Elsaid, F., Shalaby, A. (2023). Constructing Origin-Destination Demand Matrix Using Wi-Fi and Automated Fare Collection Gate Count Data: A Case Study of Toronto's Subway Network. *102nd Annual Meeting of the Transportation Research Board*. Washington, DC.

C8   **Da Silva, D.**, Robinson, M. Liu, R., Klumpenhouwer, W., Shalaby, A., and Karner, A. (2022). A Flexible Itinerary-Based Fare Calculator with Detailed Transfer Modeling. *101st Annual Meeting of the Transportation Research Board*. Washington, DC.

Conference Abstracts

D1   Klumpenhouwer, W., Allen, J., Li, L., Liu, R., Robinson, M., **Da Silva, D.**, Farber, S., Karner, A., Rowangould, D., Shalaby, A., Buchanan, M., and Higashide, S. (2021). Dashboarding Transit Accessibility *Canadian Urban Transit Association 2021 Virtual Conference*. Toronto, Canada.

D2   **Da Silva, D.**, Elsaid, F., Shalaby, A. (2023). Constructing Origin-Destination Demand Matrix Using Wi-Fi and Automated Fare Collection Gate Count Data. *25th Ontario Transportation Expo - Conference and Trade Show*. Toronto, Canada.

D3   Othman, K., **Da Silva, D.**, Shalaby, A., Abdulhai, B. (2024). Data-Driven Prediction of e-Bus Battery Consumption Rates. *Ontario Transportation Expo 2024 - Conference and Trade Show*. Toronto, Canada.

D4   Othman, K., **Da Silva, D.**, Shalaby, A., Abdulhai, B. (2025). From Planning to Deployment: Data-Driven Solutions for Bus Fleet Electrification. *Ontario Transportation Expo 2025 - Conference and Trade Show*. Toronto, Canada.

D5   Mahmoudi, R., **Da Silva, D.**, Shalaby, A.,(2025). To Fix or To Flex: Re-Optimizing Inefficient Fixed-Route Transit or Shifting to O-Demand for Greater Efficiency. *Ontario Transportation Expo 2025 - Conference and Trade Show*. Toronto, Canada.

Relevant Professional Experience

Manager, Advanced Analytics and Digital Transformation   Sao Paulo, SP, Brazil
Deloitte Touche Tohmatsu   *August 2019 - September 2021*

- Directed the planning, implementation, and operation of information systems across diverse industries, including Banking, Payments, Communications, Insurance, Logistics, and Software Development. Managed budgets, timelines, and client requirements, while assembling and supervising cross-functional teams. Developed and enforced policies for data governance, data processing, system development, and operations. Recruited and mentored personnel, overseeing professional development and training to ensure project success.

Senior Consultant, Advanced Analytics and Digital Transformation   Sao Paulo, SP, Brazil
Deloitte Touche Tohmatsu   *April 2017 - August 2019*

- Collaborated with clients to identify and document requirements, assess technical and security risks, and deliver tailored information system solutions. Conducted business and technical studies, designed and implemented software systems, and advised on strategy, policy, and service delivery. Developed and enforced policies to optimize the software development life cycle, ensuring high-quality outcomes. Performed independent third-party reviews to evaluate quality assurance practices, software products, and information systems.

Senior Analyst, IT PMO   Sao Paulo, SP, Brazil
Nextel Communications   *September 2012 - December 2015*

- Led contingency and business continuity planning, ensuring seamless deployment and quality testing of HSPA/HSPA+/LTE networks. Coordinated IT user acceptance testing across development and deployment stages, including unit, automated, and end-to-end testing, to guarantee system reliability and performance.

Product Analyst, Digital Channels   Sao Paulo, SP, Brazil
Itau-Unibanco Bank   *November 2010 - September 2012*

- Delivered data-driven insights on customer behavior across digital channels (ATM, internet banking, and mobile banking) for a customer base of approximately 16 million. Monitored and reported key performance metrics for critical banking products. Led Business Intelligence and Data Analytics projects utilizing tools such as SAS, SQL, R, and MicroStrategy to support strategic decision-making.

Student Research Mentorship

- **Co-Supervisor**: Guided Rohan Wongkee in testing machine learning methods on Wi-Fi data to predict service disruptions at the Toronto Transit Commission (TTC). University of Toronto. Supported through the Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Research Award. (Summer 2023).

- **Co-Supervisor**: Oversaw Roger Chen's MASc dissertation, Investigating Post-Pandemic Recovery Trends in Subway Ridership Using Toronto Wi-Fi Data, successfully defended in September 2024.

- **Co-Supervisor**: Mentored Jack Tattersall on his MASc dissertation, Measuring Intermodal/Interagency Connections at Suburban Rail Stations and Improving Service Integration, successfully defended in September 2024.

Ocean AI & Technology Foundations Course (OAITF) Cohort 3   Toronto, ON, Canada
Canada's Ocean Supercluster   *April 24 - June 25, 2025*

- The program addressed essential topics, including the application of data science and analytics to leverage data for decision-making and innovation. It covered cybersecurity fundamentals with a focus on protecting digital assets within the ocean technology sector. Additionally, the program explored the use of artificial intelligence to enhance operational efficiency and examined emerging technologies that transformed the ocean industry. Finally, it emphasized the importance of ethics, policy, and governance in establishing frameworks for responsible AI development within this domain. Canada's Ocean Supercluster (OSC) is an industry-led initiative funded by the Government of Canada's Global Innovation Clusters program, aimed at enhancing Canada's leadership in ocean development and the blue economy.

Deep Learning and Reinforcement Learning Summer School   Toronto, ON, Canada
Canadian Institute for Advanced Research and Vector Institute   *July, 2024*

- The Summer School, co-hosted by CIFAR and the Vector Institute, covered foundational research, new developments, and real-world applications of deep learning and reinforcement learning. Over 10 intensive days, I had the opportunity to learn from Canada CIFAR AI Chairs and other globally renowned experts from industry and academia.

Indigenous Perspectives in AI - Post Graduate   Toronto, ON, Canada
Canadian Institute for Advanced Research   *July, 2024*

- Self-paced independent learning course that helped me consider how AI projects can benefit from Indigenous knowledge and perspectives, and contribute to efforts towards reconciliation. Certification ID: azsdtdqcyf

Trustworthy and Responsible AI Learning (TRAIL) Certificate   Montreal, QC, Canada
Mila - Quebec Artificial Intelligence Institute   *January 19 - February 15, 2024*

- The TRAIL program provided the foundational knowledge, skills and tools to responsibly design and conduct AI projects. The 12.5-hour program also encompassed applying best practices and methodologies throughout the AI life cycle, from identifying ethical concerns to assessing impact and investigating and mitigating unintended consequences. The program also offered practical exercises to simulate decision-making in various scenarios across different industries. Certification ID: eabdc210-7776-480b-8e61-20139390864b

Deep Learning for Natural Scientists   Toronto, ON, Canada
York University and The Fields Institute for Research in Mathematical Sciences   *Fall 2023*

- Completed an advanced deep learning course by Fields Institute and the Department of Physics & Astronomy/York University. Topics: ML basics, Deep Feedforward Networks, Regularization, Optimization, Convolutional Networks, Recurrent/Recursive Nets, Attention, Transformers and applications in natural sciences.

Public Transit Planning & ITS, Public Transit Modelling   Toronto, ON, Canada
University of Toronto   *August 15 - 17, 2023*

- Attended and completed two courses over three days on public transit planning, modelling, and the application of information technology systems in transit.

- Learned from world-renowned transit researchers Drs Nigel Wilson, Eric Miller, Amer Shalaby, and Brendon Hemily.

Professional Certification - Scrum Master I   Sao Paulo, SP, Brazil
Scrum.org   *June 4, 2018*

  • Scrum Master Certification for Agile Project Management.

Summer School on Big Data   Rio de Janeiro, RJ, Brazil
Federal University of Rio de Janeiro   *May, 2014*

  • New developments and real-world applications in Natural Language Processing (NLP).

Conferences, Events and Programs   Toronto, ON, Canada
The Fields Institute for Research in Mathematical Sciences

  • Conference on Optimization - November 25 - 27, 2019.

  • Conference on Data Science and Optimization - November 18 - 20, 2019.

  • Conference on Data Science - November 12 - 15, 2019.

  • Winter School on Computational Data Science and Optimization - November 4 - 8, 2019.

  • Quantum Futures Hackathon - October 18 - 20, 2019.

  • Bootcamp on Machine Learning for Finance - September 26 - 27, 2019.

MOOCs
edX

  • Urban Transit for Livable Cities - University of Pennsylvania - Issued August 4, 2023.

  • Leveraging Urban Mobility Disruptions to Create Better Cities - MITx - Issued August 4, 2023.

  • Big Data and Social Physics - MITx - Issued May 23rd, 2014.

Coursera

  • Supervised Machine Learning: Regression and Classification - Stanford University - Issued August 19, 2022.

  • Exploratory Data Analysis - Johns Hopkins University - Issued August 5, 2014.

  • Getting and Cleaning Data - Johns Hopkins University - Issued June 17, 2014.

  • R Programming - Johns Hopkins University - Issued May 8, 2014.

DeepLearning.AI

  • Multi AI Agent Systems with crewAI - Issued March, 2025.

Volunteer and Extracurricular Activities

Climate Resilient Communities (CRC.green)   Toronto, ON, Canada
Volunteer Software Engineer   *Spring 2023 - Fall 2024*

  • The winner solution at Cohere For AI (C4AI) Expedition Aya 2024. We built a multilingual chatbot system to improve community data literacy and increase participation in climate adaptation.

  • Led the development of a user-friendly open-data platform to support low-income communities in Toronto to tackle climate change.

  • Volunteered as an instructor for training community leaders in Data Analytics and Civic Innovation.

University of Toronto Grappling Club   Toronto, ON, Canada
Hart House Martial Arts Instructor   *2019 - 2024*

- Brazilian Jiu Jitsu (BJJ) Black Belt. International Brazilian Jiu Jitsu Federation (IBJJF) ID Number: 407649

- BJJ Referee issued by CBJJE (Brazilian Confederation of Sport Jiu Jitsu).

- BJJ Coach at the Hart House/UofT.

- First Aid & CPR/AED level C (BL) issued by Canadian Red Cross. Certificate number: 105351387. Expiry Date: 2027-09-08

Nextel Institute Tutoring Program   Sao Paulo, SP, Brazil

Tutor   *Spring 2014*

- Volunteered as a tutor in vocational training for high school students who were in situations of social vulnerability.