GUSTAVO ASCHIDAMINI

Email: gustavo_aschidamini@sfu.ca
Power & Energy Systems Research Group, SRYE 5042, SFU Surrey Engineering Building, Surrey, BC, Canada

EDUCATION

- **Ph.D. student in Sustainable Energy Engineering** (May 2023 to Present)
  Simon Fraser University, Surrey, BC, Canada
  Topic: Control of Heat Pumps for Energy Flexibility in Distribution Networks.
  Supervisor: Dr. Mariana Resener
  Relevant coursework: *Machine Learning for Sustainable Systems*, *Smart Grids*, *Volt-var Control in Power Distribution Networks.* GPA: 4.33
- **M.Sc., Electrical Engineering** (Oct. 2022)
  Federal University of Rio Grande do Sul, Brazil
  Concentration: Power Systems
  Thesis: A Framework for Reliability Assessment in Expansion Planning of Power Distribution Systems.
  Supervisor: Dr. Mariana Resener
  Relevant coursework: *Mathematical Optimization, Experimental Design and Data Analysis, Power System Analysis, and Wind Energy.*
- **B.Sc., Electrical Engineering** (Feb. 2020)
  Pontifical Catholic University of Rio Grande do Sul, Brazil
  Concentration: Power Converters
  Thesis: Study and Development of a ZETA Converter for Power LED Power Supply. [original in Portuguese].
  Relevant coursework: *Power Electronics, Microcontroller Programming & Interfacing, and Embedded Systems.*

GRADUATE RESEARCH EXPERIENCE

- **Power and Energy Systems Research Group** (May 2023 to Present)
  Simon Fraser University, Surrey, BC, Canada
  Graduate Researcher
  - Mitacs project titled “Evaluating Grid Modernization Pathways, Opportunities and Emissions Impacts” in partnership with the company Generac Power Systems Inc.
  - Graduate Research Assistantship from School of Sustainable Energy Engineering, SFU.
  - Reviewer for power systems conferences organized by IEEE in North America and Latin America and articles in the journals *Energy Systems* and *Reliability Engineering & System Safety* published by *Elsevier*.
  - Volunteer at Team Phantom: SFU Formula SAE Electric to contribute to the simulation and testing of DC-DC power converters and batteries for electric-vehicle energy supply.
  - Volunteer in the Sustainable Energy Engineering Graduate Student Research Conference (SEEGRAD 2024) at Simon Fraser University Surrey Campus, May 10, 2024.
    Organizing committee member for the Sustainable Energy Engineering Graduate Student Research Conference (SEEGRAD 2025) at Simon Fraser University, Surrey Campus (May 16, 2025). Responsible for coordinating session chair volunteers and served as chair of a technical session.
- **Power Systems Modeling and Analysis Group (GMASP)** (Aug. 2020 to Oct 2022)
  Federal University of Rio Grande do Sul, Brazil
  Graduate Researcher
  - R&D Project: Integrated Planning for Definition of Expansion Projects in Distribution Networks Considering Probabilistic Criteria. Funded by CEEE Equatorial power distribution utility in Brazil.
  - M.Sc. degree scholarship from CAPES – Coordination for the Improvement of Higher Education Personnel, Brazil – Finance Code 001.

TEACHING ASSISTANT EXPERIENCE

- **School of Sustainable Energy Engineering** (May 2023 to Present)
  SFU, Surrey, BC, Canada
  Teaching Assistant

SEE 230 – Electric Circuits (Summer/2025):

- Leading lab sessions and tutorials for students on electric circuit concepts.

SEE 463 – Embedded Computer Systems (Spring 2024/2025):

- Supported students to have hands-on experience with the industrial-level plaform Programmable Logic Controllers (PLCs) to design solutions for automation processes.

SEE 333 – Network and Communication Systems (Fall 2024):

- Led lab sessions utilizing PLCs and networking systems, incorporating simulations in Cisco Packet Tracer to teach various networking topologies and their practical applications.

SEE 331 – Power Electronics (Summer 2023/2024):

- Facilitated lab sessions and tutorials with the objective of supporting student in comprehending circuits of rectifiers, inverters, and DC-DC converters.
- Prepared lab experiments using LabVolt equipment and engaged with students in an interdisciplinary environment to stimulate their study of power electronics.
- Taught a class about simulating and designing circuits for a four-quadrant chopper with a DC motor. Provided students with a comparison of the operation of full-bridge single-phase inverters to half-bridge inverters in Summer 2023.

SEE 231 – Electronic Devices and Systems (Spring 2024):

- Facilitated lab sessions and tutorials to help students understand the basics of electronic components and circuits and build the circuits in the laboratory measuring with equipment and interpret the results.

Workshops facilitated:

- "Building Confidence as TA" at the Teaching Assistant (TA) Day for 10 to 15 TAs in Spring 2024.
- "Taking the Steam out of STEM: How to Gain Confidence and Engage Students in Labs and Tutorials" at the Teaching Assistant Day in Fall 2023.

- **School of Electrical Engineering** (Aug. 2021 to Dec. 2021)
  Federal University of Rio Grande do Sul, Brazil
  Teaching Assistant
  - Prepared exams and exercises to the Power Electronics Principles undergraduate level course, including simulation of power converters in PSIM.
  - Taught a class on DC-DC isolated converters and characteristics of practical project considerations. Showcasing a Zeta Converter applied to power led supply to support students understanding the design of transformers.

PROFESSIONAL EXPERIENCE

- **Mitacs Project in partnership with Generac** (May 2023 to Present)
  Vancouver, BC, Canada
  Intern
  - Researching the control of heat pumps for energy flexibility in sustainable and resilient energy systems for the purpose of mitigating technical issues on active distribution grids.
  - Developing innovative products that facilitate the integration of distributed energy resources onto the grid and accelerate the modernization of grid infrastructure.
  - Research in alignment with the decarbonization plan proposed by the government of Canada that aims the reduction of carbon emissions below 40% up to 2030 which includes measures to incentivize the adoption of electric heat pumps.
- **Infrastructure Management** (Aug. 2018 to Jan. 2020)
  Pontifical Catholic University of Rio Grande do Sul, Brazil
  Intern
  - Developed electrical installations projects for the expansion of laboratories and implementation of solar photovoltaic panels on the university campus.
- **LABELO - Specialized Electric-Electronic Laboratories**, Brazil (Aug. 2017 to Dec. 2017)
  Intern
  - Performed compliance tests on electrical and electronic equipment to verify their conformity to regulatory standards and safety requirements before agency inspections.

PUBLICATIONS

Peer-Reviewed Articles in Journals

1. **Aschidamini, G. L.**, Pavlovic, M., Reinholz, B., Metcalfe, M. S., Niet, T., Resener, M. Comprehensive Review on the Control of Heat Pumps for Energy Flexibility in Distribution Networks. IEEE ACCESS, 2025. 10.1109/ACCESS.2025.3569761. Journal ranking Q1 (Engineering).
   Preprint: doi:10.48550/arXiv.2502.14111.
2. **Aschidamini, G. L.**; da Cruz, G. A.; Resener, M.; Leborgne, R. C.; Pereira, L. A.. A Framework for Reliability Assessment in Expansion Planning of Power Distribution Systems. Energies, 2022. doi:10.3390//en15145073. Journal ranking Q1 (Engineering). Cited by 33 (Google Scholar)
3. **Aschidamini, G. L.**; da Cruz, G. A.; Resener, M.; Ramos, M. J. S.; Pereira, L. A.; Ferraz, B. P.; Haffner, S.; Pardalos, P. M.. Expansion Planning of Power Distribution Systems Considering Reliability: A Comprehensive Review. Energies, 2022. doi:10.3390/en15062275. Journal ranking Q1 (Engineering). Cited by 13 (Google Scholar)

Manuscript in Preparation for Journal Submission

1. Scheid, D.S.; **Aschidamini, G. L.**; Finck, E. S.; Ferraz, B. P.; Haffner, S.; Pereira, L. A.; **Resener, M.** Practical Method for Behind-the-meter Solar Photovoltaic Power Generation Disaggregation. Submitted for publication in IEEE ACCESS.

Industry Report

2. **Aschidamini, G. L.** *et al.* Report on the Literature Review: Volt-var Control, Losses Minimization and Challenges of Coordinating DERs and Keeping the Grid's Integrity in Capacity and Voltage Levels. Project: Evaluating Grid Modernization Pathways, Opportunities and Emissions Impacts. Subproject: Dynamic Voltage Control and Operational Optimization of Power Distribution Networks. 2024. (Internal Report)

Conference Papers

1. **Aschidamini, G. L.**; Holzbach, M.; Reinholz, B. A.; Metcalfe, M. S.; Resener, M. "Impact of the Electrification of Vehicles and Integration of Solar Photovoltaic Systems on Low-voltage Distribution Networks", 2024 IEEE Canadian Conference of Electrical and Computer Engineering, Kingston, Ontario, Canada, Aug. 06-09, 2024. doi:10.1109/CCECE59415.2024.10667099
2. Holzbach, M.; Baquero, J. F. F.; **Aschidamini, G. L.**; Resener, M. "Metaheuristics Applied to the Optimal Renewable Microgrid Sizing to Supply Remote Communities", 2024 IEEE Canadian Conference of Electrical and Computer Engineering, Kingston, Ontario, Canada, Aug. 06-09, 2024. doi: 10.1109/CCECE59415.2024.10667220
3. **Aschidamini, G. L.**; Shabani, A.; Reinholz, B. A.; Metcalfe, M. S.; Resener, M. "Representative Time-series Scenarios on Residential Power Demand, Electric Vehicle Charging, and Photovoltaic Generation Based on Unsupervised Learning Algorithms", 2024 IEEE International Conference on Environment and Electrical Engineering, Rome, Italy, June 17-20, 2024. doi:10.1109/EEEIC/ICPSEurope61470.2024.10751067
4. Resener, M.; **Aschidamini, G. L.**; Ferraz, B. P.; Almeida, L. C.; Scheid, D. S.; Haffner, S.; Leborgne, R. C.; Pereira, L. A. "Framework for Distribution Systems Planning Considering Probabilistic Criteria", IEEE PES Innovative Smart Grid Technologies Latin America 2023 (ISGT-LA 2023), San Juan, Puerto Rico, Nov. 6-9, 2023. doi:10.1109/ISGT-LA56058.2023.10328288
5. **Aschidamini, G. L.**; Resener, M. "Evaluating Reliability in Expansion Planning of Primary Distribution Networks", 2023 CIGRE Canada Conference & Exhibition, Vancouver, BC, Canada, Sept. 25–28, 2023.
6. **Aschidamini, G. L.**; da Cruz, G. A.; Almeida, L. C.; Garcia, J. D. D.; Resener, M.; Leborgne, R. C.; Pereira, L. A. "Software for Power Distribution System Expansion Planning Considering Reliability", XXIV Brazilian Congress of Automatics, Fortaleza, CE, Brazil, Oct. 16–19, 2022. *Paper Awarded with Honourable Mention.
7. Almeida, L. C.; Leborgne, R. C.; Garcia, J. D. D; **Aschidamini, G. L.**; Martini, E. M.; Resener, M. "Expansion Planning of Distribution Systems: a Methodology Based on Financial Compensations Estimated by Groups of Transformers", XIII Brazilian Congress of Energy Planning, hybrid event, Aug. 24–26, 2022.
8. **Aschidamini, G. L.**; da Cruz, G. A.; Martini, E. M.; Garcia, J. D. D.; Resener, M.; Leborgne, R. C.; Pereira, L. A. "Method for Assessing the Impact of Expansion Planning Projects on the Reliability of Power Distribution Systems", IX Brazilian Symposium on Power Systems, Santa Maria, RS, Brazil, July 10–13, 2022.

PRESENTATIONS

1. **Aschidamini, G. L.** et al., "Representative Time-series Scenarios on Residential Power Demand, Electric Vehicle Charging, and Photovoltaic Generation Based on Unsupervised Learning Algorithms". 2024 IEEE International Conference on Environment and Electrical Engineering, Rome, Italy, June 19, 2024.
2. **Aschidamini, G. L.** et al., "Assessing the Impact of Electric Vehicle Charging and Residential Solar Photovoltaic Generation on Distribution Grids", Sustainable Energy Engineering Graduate Student Research Conference (SEEGRAD 2024), Simon Fraser University - Surrey Campus, May 10, 2024.
3. **Aschidamini, G. L.** et al., "Representative Time-series Scenarios on Residential Power Demand, Electric Vehicle Charging, and Photovoltaic Generation Based on Unsupervised Learning Algorithms", SEEGRAD 2024, Simon Fraser University - Surrey Campus, May 10, 2024. (Poster presentation)
4. **Aschidamini, G. L.**; Carreiro, J. M. "Building Confidence as Teaching Assistant", Spring 2024 Teaching Assistant (TA) Day, Simon Fraser University, Burnaby, BC, Canada, Jan. 12, 2024.
5. **Aschidamini, G. L.**; Resener, M. "Evaluating Reliability in Expansion Planning of Primary Distribution Networks ", 2023 CIGRE Canada Conference & Exhibition, Vancouver, BC, Canada, Sept. 25–28, 2023.
6. **Aschidamini, G. L.**; Carreiro, J. M. "Workshop on Taking the Steam out of STEM: How to Gain Confidence and Engage Students in Labs and Tutorials", Teaching Assistant Day, SFU, Burnaby, BC, Canada, Sept. 8, 2023.
7. **Aschidamini, G. L.** et al., "Software for Power Distribution System Expansion Planning Considering Reliability", XXIV Brazilian Congress of Automatics, Fortaleza, CE, Brazil, 2022.
8. **Aschidamini, G. L.** et al., "Method for Assessing the Impact of Expansion Planning Projects on the Reliability of Power Distribution Systems", IX Brazilian Symposium on Power Systems, Santa Maria, RS, Brazil, 2022.

PATENTS/COPYRIGHTS

1. Ramos, M. J. S.; Ferraz, B. P.; Pereira, L. A.; Resener, M.; Leborgne, R. C.; Haffner, S.; Almeida, L. C.; **Aschidamini, G. L.**; Martini, E. M.; da Cruz, G. A.; Garcia, J. D. D., "SisPlan – Reliability", 2022. Patent: software, Reg. number: BR512022003279-1, Patent office: INPI, National Institute of Industrial Property, Brazil.
2. Ramos, M. J. S.; Ferraz, B. P.; Pereira, L. A.; Resener, M.; Leborgne, R. C.; Haffner, S.; Scheid, D. S.; Finck, E. S.; Almeida, L. C.; **Aschidamini, G. L.**; Martini, E. M.; da Cruz, G. A.; Garcia, J. D. D., "SisPlan – Integrated Planning", 2022. Patent: software, Reg. number: BR512022003362-3, Patent office: INPI, Brazil.
3. Ramos, M. J. S.; Ferraz, B. P.; Pereira L. A.; Resener, M.; Leborgne, R. C.; Haffner, S.; Almeida, L. C.; **Aschidamini, G. L.**; Martini, E. M.; da Cruz, G. A.; Garcia, J. D. D.; Zanatta, A. P., "SisPlan – Transformers", 2022. Patent: software, Reg. number: BR512022003280-5, Patent office: INPI, Brazil.

TECHNICAL SKILLS

- Simulation of power distribution and transmission systems using software OpenDSS and PowerWorld.
- Simulation of power electronic circuits in PSIM, PSpice, and MatLab Simulink.
- Development of algorithms in MatLab, C, Python, and MathCad.
- Development of optimization models for complex real-world problems, such as power system operations.
- Experience in writing academic papers and presentation slides in LaTex.
- Short course on "Operating Evelopes and Their Implementations", The University of Melbourne, online, 13-14 March, 2024.
- Real-time simulation of the operation of power distribution systems using hardware-in-the-loop technologies. This includes a course on "OP204: ePHASORsim - Electro-Mechanical Real-Time Simulation", "OP101: RT-LAB - Real-Time Simulation Systems Fundamentals", and "OP302: Functional Mock-up Unit (FMU) Integration in ePHASORSIM".

STUDENT MEMBER AFFILIATIONS

- **Canadian National Committee of the International Council on Large Electric Systems - CIGRE Canada** (April 2023 to Present)
- **Institute of Electrical and Electronics Engineers - IEEE** (Feb. 2022 to Present)
- **IEEE Power and Energy Society - PES** (Feb. 2022 to Present)