Davi Soares

Address: 319 Wallace Hall, 1845 Fairmount
Wichita, Kansas 67260

Email : davi.soares@wichita.edu
Telephone: +1 (316) 978-6350

Education

- **Kansas State University (K-State)** — Manhattan, Kansas, United States of America
  Ph.D. in Mechanical Engineering — *Jan. 2019 – May 2021*
- **Universidade Estadual de Campinas (Unicamp)** — Campinas, São Paulo, Brazil
  Master of Science in Electrical Engineering — *Aug. 2017 – Dec. 2018*
- **Imperial College Business School** — London, United Kingdom
  Summer course in Business Strategy and Consulting — *Jul. 2014 – Aug. 2014*
- **Arizona State University (ASU)** — Tempe, Arizona, United States of America
  Undergraduate scholar — *Aug. 2012 – May 2013*
- **Universidade Federal de Itajubá (Unifei)** — Itajubá, Minas Gerais, Brazil
  Bachelor of Science in Electrical Engineering — *Mar. 2010 – Dec. 2015*

Professional experience

- **Wichita State University** — Wichita, Kansas
  Assistant professor — *August 2023 - present*
- **Freudenberg e-Power Systems** — Auburn Hills, Michigan
  Cell modeling engineer — *August 2021 - July 2023*
- **Kansas State University** — Manhattan, Kansas
  Graduate research assistant — *January 2019 - July 2021*
- **State University of Campinas** — Campinas, São Paulo, Brazil
  Graduate research assistant — *August 2017 - December 2018*
- **JS Insulators Industry** — Mogi-Mirim, São Paulo, Brazil
  Technical commercial analyst — *January 2016 - August 2017*
- **High Voltage Laboratory at Federal University of Itajuba** — Itajuba, Minas Gerais, Brazil
  Undergraduate student researcher — *May 2014 - December 2015*
- **General Electric Transportation** — Erie, Pennsylvania
  3P/New Product Introduction intern — *May 2013 - August 2013*

Grants

- **Kansas NSF EPSCoR:** "*Physics-informed machine learning model for assessment of state of health of lithium-ion batteries used in resilient infrastructure applications*", $67,652, PI. Share: 100%.
- **National Institute for Aviation Research (NIAR):** Serving as technical consultant for aerospace industry, approximately $25,000, PI. Share: 100%.
- **Multidisciplinary Research Projects (MURPA):** "*Mitigating failures in battery-powered flights: battery management through safety-critical control*", $7,498, PI. Share: 50%.
- **Tim & Laura Unruh faculty support in engineering fund:** Grant awarded to "*advance the work on understanding the longevity of rechargeable batteries*", $1,500, PI. Share: 100%

Honors & Awards

- **Wichita State University Young Faculty Risk-taker Award:** 2025.
- **Kansas NSF EPSCoR First Award:** 2023-2025.
- **Naim Z. and Beverly J. Azer mechanical engineering graduate scholarship:** 2020.
- ***São Paulo Research Foundation* (FAPESP) graduate scholarship,** 2017
- ***Japan Student Services Organization (JASSO)* scholarship,** 2018.
- **Master of science scholarship:** Sponsored by *Coordination for the Improvement of Higher Education Personnel*, 2017-2018.

- ***Young talent attraction* scholarship:** Sponsored by *Coordination for the Improvement of Higher Education Personnel*, 2014.
- ***Science without borders* scholarship:** Sponsored by *Institute of International Education*, 2012.
- **Medal of Honor:** Awarded the Medal of Honor by Brazilian Army due to discipline during Military Service.

Doctoral students

- **Eric L. Pereira (spring 2024 - spring 2027 (expected)).** Conducting research on enhanced physics-informed machine learning models for resilient battery-powered infrastructure systems.
  Awards: Outstanding graduate research award, one of the ten graduate students from the entire university selected to present his research at the Capitol Graduate Research Summit (CGRS) in Topeka, KS.
- **Md Zawad Hossain (Summer 2024 - Fall 2027 (expected)).** Conducting research on kinetics behavior and its implications on degradation mechanisms of selenide-based transition metal dichalcogenides for nonaqueous monovalent-ion battery technologies.
  Awards: One of the ten graduate students from the entire university selected to present his research at the Capitol Graduate Research Summit (CGRS) in Topeka, KS.

Undergraduate students

- **Leland Seiwert:** spring 2025 - spring 2025
- **Antonio Graciano:** fall 2024 - present
- **Damilola Ogun:** fall 2023 - spring 2025

Publications (bold font indicates a student author)

Journal articles under review

[1] C. Almeida, P. Jackson, R. Vicentini, **E. Pereira**, E. Santos, L. M. Silva, D. Soares, and H. Zanin, "Charge and energy storage properties of NiO-AC composites in organic electrolyte using operando raman and distributed capacitance analyses in the time domain," *Next Energy*, pp. –, 2025, *Under review.*

[2] G. Glauco M. M. M. Lustosa, W. Bizzo, L. Souza, G. Biasotto, L. Perazolli, K. Pereira, C. Silva, D. Soares, and T. Mazon, "Boosting properties of the biochar composite by an in situ growth of nickel nanospheres through an one-step synthesis: applications in supercapacitors," *Materials Research Bulletin*, pp. –, 2025, *Under review.*

Peer-reviewed journal articles

[1] **E. L. Pereira**, **D. Ogun**, and D. M. Soares, "Comprehensive real-time insights for state of health prediction: A comprehensive framework for online state of health assessment in commercial lithium-ion batteries," *ChemElectroChem*, p. 2400708, 2025.

[2] D. M. Soares and G. Singh, "Weyl semimetal orthorhombic Td-WTe_2 as an electrode material for sodium- and potassium-ion batteries," *Nanotechnology*, vol. 32, p. 505402, sep 2021.

[3] M. Alexandreli, C. B. Brocchi, D. M. Soares, W. G. Nunes, B. G. Freitas, F. E. de Oliveira, L. E. C. A. Schiavo, A. C. Peterlevitz, L. M. da Silva, and H. Zanin, "Pseudocapacitive behaviour of iron oxides supported on carbon nanofibers as a composite electrode material for aqueous-based supercapacitors," *Journal of Energy Storage*, vol. 42, p. 103052, 2021.

[4] B. Freitas, W. G. Nunes, D. M. Soares, F. C. Rufino, C. M. Moreira, L. M. Da Silva, and H. Zanin, "Robust, flexible, freestanding and high surface area activated carbon and multi-walled carbon nanotubes composite material with outstanding electrode properties for aqueous-based supercapacitors," *Materials Advances*, vol. 2, pp. 4264–4276, 2021.

[5] D. M. Soares, Z. Ren, S. B. Mujib, S. Mukherjee, C. G. Martins Real, M. Anstine, H. Zanin, and G. Singh, "Additive manufacturing of electrochemical energy storage systems electrodes," *Advanced Energy and Sustainability Research*, vol. 2, no. 5, p. 2000111, 2021.

[6] S. B. Mujib, Z. Ren, S. Mukherjee, D. M. Soares, and G. Singh, "Design, characterization, and application of elemental 2D materials for electrochemical energy storage, sensing, and catalysis," *Materials Advances*, vol. 1, pp. 2562–2591, 2020.

[7] D. M. Soares and G. Singh, "Superior electrochemical performance of layered WTe_2 as potassium-ion battery electrode," *Nanotechnology*, vol. 31, p. 455406, aug 2020.

[8] D. M. Soares, S. Mukherjee, and G. Singh, "TMDs beyond MoS_2 for electrochemical energy storage," *Chemistry – A European Journal*, vol. 26, no. 29, pp. 6320–6341, 2020.

[9] D. M. Soares and G. Singh, "SiOC functionalization of MoS_2 as a means to improve stability as sodium-ion battery anode," *Nanotechnology*, vol. 31, p. 145403, jan 2020.

[10] D. M. Soares, R. Vicentini, A. C. Peterlevitz, C. B. Rodella, L. M. da Silva, and H. Zanin, "Tungsten oxide and carbide composite synthesized by hot filament chemical deposition as electrodes in aqueous-based electrochemical capacitors," *Journal of Energy Storage*, vol. 26, p. 100905, 2019.

[11] S. Mukherjee, J. Turnley, E. Mansfield, J. Holm, D. Soares, L. David, and G. Singh, "Exfoliated transition metal dichalcogenide nanosheets for supercapacitor and sodium ion battery applications," *Royal Society Open Science*, vol. 6, no. 8, p. 190437, 2019.

[12] R. Vicentini, W. Nunes, B. G. Freitas, L. M. D. Silva, D. M. Soares, R. Cezar, C. B. Rodella, and H. Zanin, "Niobium pentoxide nanoparticles @ multi-walled carbon nanotubes and activated carbon composite material as electrodes for electrochemical capacitors," *Energy Storage Materials*, vol. 22, pp. 311 – 322, 2019.

[13] R. Vicentini, D. M. Soares, W. Nunes, B. Freitas, L. Costa, L. M. D. Silva, and H. Zanin, "Core-niobium pentoxide carbon-shell nanoparticles decorating multiwalled carbon nanotubes as electrode for electrochemical capacitors," *Journal of Power Sources*, vol. 434, p. 226737, 2019.

[14] S. Mukherjee, S. Bin Mujib, D. Soares, and G. Singh, "Electrode materials for high-performance sodium-ion batteries," *Materials*, vol. 12, no. 12, 2019.

[15] R. Vicentini, L. H. Costa, W. Nunes, O. Vilas Boas, D. M. Soares, T. A. Alves, C. Real, C. Bueno, A. C. Peterlevitz, and H. Zanin, "Direct growth of mesoporous carbon on aluminum foil for supercapacitors devices," *Journal of Materials Science: Materials in Electronics*, vol. 29, pp. 10573–10582, Jun 2018.

[16] D. M. Soares, S. Mendonça, E. T. Neto, and M. L. Martinez, "Electrical field on non-ceramic insulators and its relation to contact angles for constant volume droplets," *Journal of Electrostatics*, vol. 84, pp. 97 – 105, 2016.

[17] I. F. S. dos Santos, N. D. B. Vieira, R. M. Barros, G. L. T. Filho, D. M. Soares, and L. V. Alves, "Economic and CO_2 avoided emissions analysis of WWTP biogas recovery and its use in a small power plant in Brazil," *Sustainable Energy Technologies and Assessments*, vol. 17, pp. 77 – 84, 2016.

Peer-reviewed conference proceedings

[1] **E. L. Pereira**, **M. Z. Hossain**, **D. Ogun**, and D. M. Soares, "Machine learning-based framework for online state of health assessment and end-of-life prediction in commercial lithium-ion batteries," in *2025 IEEE Green Technologies Conference (GreenTech)*, p. *accepted*, IEEE, 2024.

[2] **D. Ogun** and D. Soares, "Electric field analysis at triple-joints and localized defects on different composite insulators designs," in *2024 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP)*, pp. 1–4, IEEE, 2024.

Peer-reviewed book chapters

[1] S. B. Mujib, S. Mukherjee, Z. Ren, D. M. Soares, C. G. M. Real, H. Zanin, and G. Singh, *Recent Advances and Trends in Al-Ion Batteries*. CRC Press, 2024.

[2] D. M. Soares, S. Mukherjee, and G. Singh, *Transition metal dichalcogenides as active anode materials for sodium-ion batteries, Handbook of Sodium-Ion Batteries: Materials and Characterisation*. Jenny Stanford Publishing, 2023.

Conference presentations

[1] **Md Z. Hossain*** and D. M. Soares, "Temperature effect on electrochemical performance of $NbSe_2$ electrode in sodium-ion batteries," American Chemical Society (ACS) Spring 2025 Meeting & Expo, March 2025.

[2] **E. Pereira***, **D. Ogun***, and D. M. Soares, "Online state of health assessment of lithium-ion battery using physics-informed machine learning model for resilient infrastructure applications," ASME International Mechanical Engineering Congress and Exposition (IMECE 2024), November 2024.

[3] D. M. Soares and G. Singh, "A comparative study of tantalum disulfide as lithium-ion and potassium-ion batteries," MS&T 2021, October 2021.

[4] D. M. Soares and G. Singh, "Tungsten ditelluride, a semimetal transition metal dichalcogenide as active material for monovalent-ion battery electrodes," MS&T 2021, October 2021.

[5] D. M. Soares, C. Shuck, N. Kurra, Y. Gogotsi, and G. Singh, "MXene nanosheets as active materials for nonaqueous monovalent-ion battery electrodes," 2020 Materials Research Society (MRS) Spring/Fall Meeting & Exhibit, November 2020.

Invited presentations

[1] D. Soares, "Lithium-ion batteries and beyond: a comprehensive perspective on state of health assessment," pp. 2025 IEEE Green Technologies Conference, Wichita, KS, March, 2025.

[2] D. Soares, "Lithium-ion batteries and beyond: an approach from novel materials and modeling technologies," pp. Universidad Autonoma de Occidente, Cali – Colombia, September, 2024.

Teaching

				Student evaluation (Scale 1-5, 5 = Outstanding)	
Course	Level	Year	Enrollment	Course evaluation:	Instructor evaluation:
ECE 463: Applied engineering electromagnetics	Junior	Fall 2023	22	4.10	4.36
		Fall 2024	42	4.08	4.31
ECE 777AE: Characterization and modeling of batteries	Grad. / senior elective	Spring 2024	7	4.57	4.52

- **Educational activity:** Introduced a new graduate level course in Battery modeling and characterization (course number ECE 777AE: "Characterization and modeling of batteries").

Service

Department service:

- **Taught and developed lectures for ECE 777AF: *Controls, Communication and Storage for Transportation Electrification:*** (Spring 2024).
- **Electrical and Computer Engineering graduate committee member:** (Fall 2023 – present).
- **Electrical and Computer Engineering senior design faculty advisor:** (Fall 2023 – present).
- **Electrical and Computer Engineering faculty advisor:** (Fall 2023 – present).

Professional activities

- **Reviewer/panelist for:** National Science Foundation (NSF) CBET Electrochemical System, Department of Energy (DOE) ARPA-E.
- **Task force member for:** Engineering Research to Catalyze Resilient Rural Communities event, organized by the NSF-funded Engineering Research Visioning Alliance (ERVA).
- **Member of:** IEEE - Eta Kappa Nu, Materials Research Society (MRS); Tau Beta Pi.
- **Committee member:**

  1. Sonu Gangadhar Gowda (M.S. project, Asaduzzaman). *Predicting performance of heterogenerous edge-cloud systems using machine learning models.* April 2025.
  2. Rama Krishna Nallapuri (M.S. project, Aravinthan). *Performance Evaluation and Energy Analysis of a Hybrid Solar-Fuel cell Source Converter for DC Microgrid Integration.* December 2024.
  3. Vanderleia de Deus Mateus (M.S., University of Campinas, Brazil). August 2024.
  4. Syra Kelly Mubarac Silva Oliveira (M.S., University of Campinas, Brazil). August 2024.
  5. Kolade Oke (M.S., Pang). *Artificial intelligence-based distance relay behaviors for future power systems with 100% clean electricity.* July, 2024.
  6. Rafael Felipe Vicentini (Ph.D., University of Campinas, Brazil). September 2023.

- **Journal article reviewer:** Nature Nanotechnology, Advanced Materials Technologies, Nanoscale, Journal of Materials Chemistry A, Small Methods, Crystals, IOP Nanotechnology, Energies, Nano-Micro Letters, Molecules, RSC Advances, Scientific Reports, Journal of Alloys and Compounds, Physica E: Low-dimensional Systems and Nanostructures, Journal of the American Ceramic Society.