

# Davi Soares

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

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

## EDUCATION

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- **Kansas State University** Manhattan, Kansas  
*Ph.D. in Mechanical Engineering* January 2019 – August 2021
- **State University of Campinas** Campinas, Sao Paulo, Brazil  
*Master of Science in Electrical Engineering* August 2017 – December 2018
- **Federal University of Itajuba** Itajuba, Minas Gerais, Brazil  
*Bachelor of Science in Electrical Engineering* March 2010 – December 2015

## PROFESSIONAL EXPERIENCE

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- **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 Itajubá** Itajubá, Minas Gerais, Brazil  
*Undergraduate student researcher* May 2014 - December 2015
- **General Electric Transportation** Erie, Pennsylvania  
*3P/New Product Introduction intern* May 2013 - August 2013

## HONORS & AWARDS

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- **Kansas NSF EPSCoR First Award:** 2023-2024.
- **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.

## PUBLICATIONS (\* INDICATES A STUDENT AUTHOR)

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### JOURNAL ARTICLES UNDER REVIEW

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- [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," *Journal of Power Sources*, pp. –, 2025, *Under review*.
- [2] **E. Pereira\***, **D. Ogun\***, and D. Soares, "CRISP: a comprehensive framework for online state of health assessment in commercial lithium-ion batteries," *ChemElectroChem*, pp. –, 2024, *Under review*.
- [3] G. Glauco M. M. M. Lustosa, W. Bizzo, L. Souza, G. Biasotto, L. Perazolli, K. Pereira, C. Silva, D. Soares, and T. Mazon, "Nickel nanospheres@biochar composites through one-step synthesis for enhancing the performance of porous-carbon-based supercapacitors," *Energy*, pp. –, 2025, *Under review*.

- [1] D. M. Soares and G. Singh, "Weyl semimetal orthorhombic Td-WTe<sub>2</sub> as an electrode material for sodium- and potassium-ion batteries," *Nanotechnology*, vol. 32, p. 505402, sep 2021.
- [2] 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.
- [3] 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.
- [4] 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.
- [5] 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.
- [6] D. M. Soares and G. Singh, "Superior electrochemical performance of layered WTe<sub>2</sub> as potassium-ion battery electrode," *Nanotechnology*, vol. 31, p. 455406, aug 2020.
- [7] D. M. Soares, S. Mukherjee, and G. Singh, "TMDs beyond MoS<sub>2</sub> for electrochemical energy storage," *Chemistry – A European Journal*, vol. 26, no. 29, pp. 6320–6341, 2020.
- [8] D. M. Soares and G. Singh, "SiOC functionalization of MoS<sub>2</sub> as a means to improve stability as sodium-ion battery anode," *Nanotechnology*, vol. 31, p. 145403, jan 2020.
- [9] 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.
- [10] 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.
- [11] 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.
- [12] 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.
- [13] S. Mukherjee, S. Bin Mujib, D. Soares, and G. Singh, "Electrode materials for high-performance sodium-ion batteries," *Materials*, vol. 12, no. 12, 2019.
- [14] 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.
- [15] 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.

- [16] 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<sub>2</sub> 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.

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#### PEER-REVIEWED CONFERENCE PROCEEDINGS

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- [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. M. 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)*, p. *in press*, IEEE, 2024.

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#### PEER-REVIEWED BOOK CHAPTERS

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- [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.

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#### CONFERENCE PRESENTATIONS

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- [1] **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.
- [2] D. M. Soares and G. Singh, "A comparative study of tantalum disulfide as lithium-ion and potassium-ion batteries," MS&T 2021, October 2021.
- [3] 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.
- [4] D. M. Soares and G. Singh, "Layered Te-based transition metal dichalcogenides as stable beyond lithium-ion battery electrodes," XIX Brazilian Materials Research Society Meeting (XIX B-MRS), August 2021.
- [5] D. M. Soares and G. Singh, "Unveiling electrochemical performance of tantalum disulfide (TaS<sub>2</sub>) as beyond lithium-ion battery anode material," XIX Brazilian Materials Research Society Meeting (XIX B-MRS), August 2021.
- [6] D. M. Soares and G. Singh, "Electrochemical studies of TaS<sub>2</sub> as electrode material for monovalent-ion batteries," MRS Spring 2021, April 2021.
- [7] D. M. Soares and G. Singh, "Layered tungsten-based dichalcogenides as potassium-ion battery electrodes," 45<sup>th</sup> International Conference and Expo on Advanced Ceramics and Composites (ICACC 2021), February 2021.
- [8] D. M. Soares and G. Singh, "Polymer-derived ceramics functionalization of molybdenum disulfide towards electrochemical stability of sodium-ion battery electrode," 45<sup>th</sup> International Conference and Expo on Advanced Ceramics and Composites (ICACC 2021), February 2021.
- [9] D. M. Soares and G. Singh, "WTe<sub>2</sub>, a semimetal transition metal dichalcogenide electrode for potassium-ion batteries," 2020 Materials Research Society (MRS) Spring/Fall Meeting & Exhibit, November 2020.
- [10] 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.

- [11] D. M. Soares, C. Shuck, N. Kurra, Y. Gogotsi, and G. Singh, "Mo<sub>2</sub>TiC<sub>2</sub> and Mo<sub>2</sub>Ti<sub>2</sub>C<sub>3</sub> Mxene nanosheets as electrode materials for sodium- and potassium-ion batteries," ASME International Mechanical Engineering Congress and Exposition (IMECE 2019), November 2020.
- [12] D. M. Soares and G. Singh, "Silicon carbon nitride (SiCN) and silicon oxycarbide (SiOC) functionalization of molybdenum disulfide (MoS<sub>2</sub>) as stable battery electrodes," Materials Science & Technology 2020 (MS&T20), November 2020.
- [13] D. M. Soares, C. Shuck, N. Kurra, S. Justus, P. Herold, M. Ellis, Y. Gogotsi, and G. Singh, "MXene nanosheets as lithium, sodium-, and potassium-ion batteries: a fundamental study," American Chemical Society (ACS) Fall 2020 Virtual Meeting & Exposition, August 2020.
- [14] D. Soares, S. Justus, P. Herold, M. Ellis, and G. Singh, "Polymer-derived ceramics functionalization of sulphur-based TMD for electrochemical stability of sodium-ion battery anode," American Chemical Society (ACS) Fall 2020 Virtual Meeting & Exposition, August 2020.
- [15] D. M. Soares, C. Shuck, N. Kurra, Y. Gogotsi, and G. Singh, "MXene nanosheets as alkali metal-ion battery electrodes: Initial studies," MXenes: Ten Years Later Conference, August 2020.
- [16] D. Marcelo and G. Singh, "Two dimensional nanomaterials functionalized by polymer-derived ceramic as stable battery electrodes," 44<sup>th</sup> International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020), January 2020.
- [17] S. B. Mujib, S. Mukherjee, D. M. Soares, Z. Ren, and G. Singh, "Corrosion resistance of 2D nanomaterial-based coatings on stainless steel substrates," 44<sup>th</sup> International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020), January 2020.
- [18] D. M. Soares, R. Vicentini, G. Singh, A. C. Peterlevitz, and H. Zanin, "Tungsten oxide and carbide composite electrodes for electrochemical capacitors synthesized by hot filament vapor deposition technique," 44<sup>th</sup> International Conference and Expo on Advanced Ceramics and Composites (ICACC 2020), January 2020.
- [19] D. Soares, R. Vicentini, H. Zanin, and G. Singh, "Core/shell Nb<sub>2</sub>O<sub>5</sub> nanoparticles/carbon on carbon nanotubes as symmetrical supercapacitor electrodes," ASME International Mechanical Engineering Congress and Exposition (IMECE 2019), November 2019.
- [20] D. Soares and G. Singh, "Electrochemical performance of polymer-derived ceramic functionalized transition metal dichalcogenides," ASME International Mechanical Engineering Congress and Exposition (IMECE 2019), November 2019.
- [21] S. Bin-Mujib, S. Mukherjee, D. Arreola, D. M. Soares, and G. Singh, "Assessing corrosion resistance of 2D nanomaterial-based coatings on stainless steel substrates," ASME International Mechanical Engineering Congress and Exposition (IMECE 2019), November 2019.
- [22] D. Soares and G. Singh, "Electrochemical behavior of polymer-derived ceramic functionalized transition metal dichalcogenides (TMD)," 13<sup>rd</sup> Pacific Rim Conference of Ceramic Societies (PACRIM13), October 2019.
- [23] D. Soares and G. Singh, "Electrochemical behavior of functionalized transition metal dichalcogenide nanosheets," American Chemical Society (ACS) Fall 2019 National Meeting & Exposition, August 2019.
- [24] D. Soares, R. Vicentini, H. Zanin, and G. Singh, "Core/shell Nb<sub>2</sub>O<sub>5</sub> nanoparticles/carbon on carbon nanotubes as symmetrical supercapacitor electrodes," National Science Foundation (NSF) Partnerships for International Research and Education (PIRE) Workshop, July 2019.
- [25] C. G. M. Real, R. Vicentini, W. G. Nunes, O. V. Boas, T. A. Alves, D. M. Soares, and H. Zanin, "Polyacrylonitrile and activated carbon composite for electric double layer capacitors," in *SAE Technical Paper*, SAE International, September 2018.

- [26] C. G. M. Real, R. Vicentini, W. G. Nunes, O. V. Boas, L. H. Costa, D. M. Soares, and H. Zanin, “Electric double layer capacitors prepared with polyvinyl alcohol and multi-walled carbon nanotubes,” in *SAE Technical Paper*, SAE International, September 2018.

#### INVITED PRESENTATIONS

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- [1] 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

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Course	Level	Year	Enrollment	Student evaluation (Scale 1-5, 5 = Outstanding)	
				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

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##### 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

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- **Reviewer/panelist for:** National Science Foundation (NSF) CBET Electrochemical System, Department of Energy (DOE) ARPA-E.
- **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

- **Member of:** IEEE - Eta Kappa Nu, Materials Research Society (MRS), Tau Beta Pi.

- **Committee member:**

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