The University of New Brunswick

CURRICULUM VITAE

SECTION 1: BIOGRAPHICAL

Surname: CARDENAS BARRERA

Given Names: JULIAN LUCIANO

Signature: Julian L Cardenas Barrera

Digitally signed by Julian L Cardenas Barrera
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Faculty/Department Address:

University of New Brunswick
Electrical and Computing Engineering
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Canada
Home Phone No. (506) 252 3552

Present Citizenship Status: Canadian Citizen

SECTION 2: EDUCATION

2.1 Post Secondary Education (Date, Institution, Degree)

- 1998/8, Electrical Engineering, Universidad Central "Marta Abreu" de Las Villas, Cuba. PhD
- 1984/7, Electrical Engineering, Universidad Central "Marta Abreu" de Las Villas, Cuba, B.A.

2.2 Title of Graduate Thesis and Supervisor's Name:

- **PhD Thesis title**: ECG Signal Compression using Vector Quantization.
- **Supervisor**: Juan V. Lorenzo Ginori, 1995/1 - 1998/7

2.3 Other Formal Education (if applicable): None

2.4 Briefly Indicate General Area (s) of Academic Interest:

- Energy Forecasting.
- Demand response and load management.
- Distributed energy resource management.
- Grid integration of renewable energy.
- Grid resilience and reliability.
- Grid optimization and control.
- Smart grid communication and sensing technologies.
- Microgrids and community energy systems.
- Stochastic optimization in the smart grid.
- Quantum Computing for smart grid applications.

SECTION 3: EMPLOYMENT

3.1 Employment History at UNB
(List Date and rank of initial appointment, dates of grant of tenure and promotion)

2022/4 – Present

Associate Professor
Department of Electrical and Computer Engineering
Full-time
Tenure Status: Tenure Track

NB Power Industrial Research Chair in Smart Grid Technologies
Emera and NB Power Research Centre for Smart Grid Technologies
Department of Electrical and Computer Engineering
Full-time
Tenure Status: Non-Tenure Track

2017/9 - 2022/3

Research Associate
Emera and NB Power Research Centre for Smart Grid Technologies,
Department of Electrical and Computer Engineering
Full-time, Term
Tenure Status: Non-Tenure Track

Adjunct Professor
Department of Electrical and Computer Engineering
Term

2014/7 - 2017/9

Visiting Scholar
Department of Electrical and Computer Engineering
Full-time, Visiting Professorship
Tenure Status: Non-Tenure Track
Conduct research and co-supervise graduate students and post-doctoral fellows.

3.2 List Relevant Previous Employment in Chronological Order (Institution, Position, Date)

Full-time Positions

Universidad Central "Marta Abreu" de Las Villas.

- Faculty of Electrical Engineering, Department of Telecommunications and Electronics
  - **Full Professor**: 2008/9 - 2014/7
  - **Associate Professor**: 2005/9 - 2008/9
  - **Assistant Professor**:1992/9 - 2005/9

- Faculty of Mathematics, Physics, and Computer Science,

- **Assistant Professor**: 1988/9 - 1992/9
- **Lecturer**: 1984/8 - 1988/9

Visiting Scholar/Researcher Positions

Visiting Scholar.	Department of Electrical and Computer Engineering, University of New Brunswick, Canada.	Jul-2014-2017, Jan-Apr 2013, Jan-May 2011, 2006, 2007
Visiting Scholar.	Faculty of Engineering, Universidad Cooperativa de Colombia, Colombia.	1999 – 2014 One or two months per year
Visiting Professor.	Department of Engineering, Fundación Universitaria Los Libertadores, Colombia	April 2014
Visiting Researcher.	Department of Signal Theory and Communications, Universidad de Alcalá de Henares, Spain.	Oct-Dec 2009
Visiting Professor.	Department of Engineering, Universidad de Ibagué, Colombia.	April 2007
Visiting Professor.	Department of Electrical Engineering, Universidad Nacional de Ingeniería, Managua, Nicaragua.	Mar 2005
Visiting Scholar.	Department of Electrical and Computer Engineering, University of Toronto, Canada.	Sept-Dec. 2000
Visiting Professor.	Universidad Mesoamericana, San Cristobal de Las Casas, Mexico.	Jan-Feb 1997
Visiting Professor.	Department of Engineering, Instituto Tecnológico de Comitán, México.	Sept 1996-Feb 1997
Visiting Professor.	CEDIMI, Faculty of Mechanical and Electrical Engineering, Universidad Autónoma de Nuevo León, Monterrey, México.	Nov-Dic 1992

3.3 Leaves granted by UNB or other University (type, date)

None.

3.4 Distinctions, Honours, Fellowships, Scholarships (with dates)

- Award for his/her Teaching Work, Universidad Cooperativa de Colombia, Colombia. *2008*
- Annual Provincial Award for Relevant Research, Ministry of Public Health, Cuba. 2007, 2004, 2002, 1999
- Medal for the Cuban Education *2006*
- Award for Scientific Achievement, Scientific Council, Faculty of Electrical Engineering, UCLV, Cuba. *2006*

- Annual Award for Scientific Merit, Special Mention from the Scientific Council of UCLV, Cuba. *2003*
- Annual National Award for Relevant Research, Ministry of Public Health, Cuba. *1999*
- Honorary Distinction "50th Anniversary of UCLV" for Relevant Merits and Results in the performance of his job, UCLV. Cuba. *1998*
- Annual Provincial Award for Relevant Research, Ministry of Science, Cuba *1996*

SECTION 4: DISSEMINATION OF KNOWLEDGE

4.1 Courses Taught in preceding 5 years (indicate course number and title, year, enrolment)

Legend:
U – Undergraduate, G – Graduate,
WI – Winter, SM – Summer, FA – Fall,
CS – Computer Science, SWE – Software Engineering, EE – Electrical Engineering, ECE – Electrical and Computer Engineering.

Courses at UNB

Course No.	*Title*	*Type*	*Year*	*Term*	*Enrollment*
CS 4999	Solar Power Forecasting	U	2025	WI	1
ECE 4913	Decentralized Energy Mgt Sys	U			1
SWE 4913	DTR Tool for Power Systems	U			1
CS 4015	Software Architecture and Design Patterns.	U			11
SWE 4403	Software Architecture and Design Patterns.	U			30
CS 6075	Software Architecture and Design Patterns.	G			7
ENGG4000	Software Design - Supervisor	U	2024-25	YEAR	6
EE 6663	Smart Grid Technologies and Operation	G	2024	FA	19
EE 6013	Topics in Smart Grid technologies.	G		SM	3
CS 4015	Software Architecture and Design Patterns.	U		WI	5
SWE 4403	Software Architecture and Design Patterns.	U			20
CS 6075	Software Architecture and Design Patterns.	G			16
CS 6673	Data Analytics for the Smart Grid.	G			13

CS 4015	Software Architecture and Design Patterns.	U	2023	WI	12
SWE 4403	Software Architecture and Design Patterns.	U			22
CS 6075	Software Architecture and Design Patterns.	G			23

ECE 2214	Digital Logic Design.	U	2022	FA	81
ECE 2215	Digital Logic Design Laboratory.	U			86

CS 4015	Software Architecture and Design Patterns.	U	2022	WI	18
SWE 4403	Software Architecture and Design Patterns.	U			22
CS 6075	Software Architecture and Design Patterns.	G			21

EE 6013	Topics in Smart Grid Technologies.	G	2020	WI	4

EE 6013	Topics in Smart Grid Technologies.	G	2019	FA	2
EE 6013	Topics in Smart Grid Technologies.	G		SM	2

ECE 3242	Computer Architecture.	U	2018	WI	30
EE 6943	Basis of Biomedical Engineering. Lecture: *Biomedical Speech Processing*	G			18

4.2 Development of New Courses

Note: I deliberately design specialized, low-enrollment courses (e.g., EE 6013 Topics in Smart Grid Technologies) as targeted research incubators. These courses function as:

- **Graduate accelerators:** Providing bespoke training in niche methodologies (quantum computing for grid optimization) not covered in standard curricula
- **Undergraduate innovation labs:** Project-based courses like SWE 4913 where students solve industry challenges from NB Power/Emera collaborations, resulting in deployable tools (e.g., DTR systems)

- CS 4999 "Solar Energy Forecasting" 2025
- ECE 4913 "Decentralized Energy Mgt Sys" 2025
- SWE 4913 "DTR Tool for Power Systems" 2025
- EE 6663 "Smart Grid Technologies and Operation". 2024
- EE 6673 "Data Analytics for Smart Grid". 2024
- CS 6075 "Software Architecture and Design Patterns" 2022 –

- CS 4015 "Software Architecture and Design Patterns" 2022 –
- CS 6075 "Software Architecture and Design Patterns" 2022 –
- EE 6013 "Topics in Smart Grid technologies" 2019-2020, 2023-2025
- EE 3242 "Computer Architecture" 2018

4.3 Updating of Existing Courses

Note: Courses are updated annually based on student survey results, experiences with student engagement and performance, and current developments or new textbook editions.

- EE 6673 "Data Analytics for Smart Grids" 2025
- CS 4015 "Software Architecture and Design Patterns" 2025
- CS 6075 "Software Architecture and Design Patterns" 2025
- SWE 4403 "Software Architecture and Design Patterns" 2025

4.4 Effective Use or Development of Teaching Aids and Techniques

My strategies to enhance the learning experience for students include, but are not limited to:

- *Visual Aids:* Mainly through PowerPoint and Keynote to present in a visually appealing manner and stimulate students' visual understanding and memory.
- *Foster active learning* by encouraging active participation through interactive techniques and tools that promote deeper understanding, critical thinking, and information retention. As an example, I have been using an interactive presentation tool called Mentimeter for this purpose.
- *Cooperative learning* by using course projects to foster collaboration, communication, and teamwork, enabling students to learn from each other and develop social skills.

Regularly assess and evaluate by gathering feedback from students. Two main surveys, the Teaching Feedback Survey and the Stop-Start-Continue Survey, are requested at mid-semester to collect information about student engagement, learning outcomes, and overall satisfaction. I make adjustments and improvements based on the feedback received to enhance the aids and techniques over time.

4.5 Involvement in Curriculum Development

- SWE Oversight Committee Dept. Level 2024-
- Undergraduate Coordinator of the Biomedical Engineering undergraduate program, Faculty of Electrical Engineering, UCLV. Univ. Level 2008-2014
- Director of the Biomedical Engineering studies, Faculty of Electrical Engineering, UCLV. Faculty level 2009-2012
- Coordinator of the 4th academic year of Biomedical Engineering, Faculty of Electrical Engineering, UCLV. Faculty level 2007-2012
- Coordinator of the 2nd academic year of Biomedical Engineering, Faculty of Electrical Engineering, UCLV. Faculty level 2005-2006

- Coordinator of the Signals and System discipline, Biomedical Engineering Undergraduate program, Faculty of Electrical Engineering, UCLV. Dept. level 2005-2006

4.6 Organization of Field Schools, Labs, or Practica

4.7 a) Direction of Research of Undergraduate or Graduate Studies (identify student name, topic, dates and level -- bachelors, masters, doctorate)

Note: All students were co-supervised between 2014/6-2022/8 as per UNB rules.

In Progress:

Period	Student/Researcher	Institution	Thesis/Project Title	Level	Role
2024/1 - 2026/1	Tohid Rahimi	UNB	VPP Hierarchical Optimization and Control Systems	Post-doctorate	Supervisor
2021/3 - 2025/9	Faezeh Bashiri	UNB	Forecasting of aggregation of embedded energy resources	Doctorate	Supervisor
2022/3 - 2025/9	Wei Shang	UNB	VoicedTracks and its Application in Speech Playback Attack Detection	Doctorate	Principal Supervisor
2024/5 - 2026/4	Anas Cherif	UNB	Advanced Forecasting Techniques for Wind Power Generation	Master	Supervisor
2024/1 -2025/12	Sakib Shahriar Joy	UNB	Sensitivity-Guided Parameter Screening for WECC Composite Load Identification	Master	Supervisor
2023/9 - 2025/9	Bishal Das	UNB	Load modelling for emerging power system assessments	Master	Principal Supervisor
2022/9 - 2025/9	Whomaira Durdana	UNB	EV charging infrastructures and their impact on power systems	Master	Supervisor
2023/9 - 2027/12	Michael Bourque	UNB	Evaluation of digital twins in Smart grid applications	Master	Co-Supervisor

Upcoming:

Period	Student/Researcher	Institution	Thesis/Project Title	Level	Role
2026/1 – 2029/12	Abdallah Wael Mustafa	UNB	Optimizing Distributed Solar Energy Systems through Forecasting & Smart Grid Integration	Doctorate	Supervisor
2025/9 – 2027/8	Muhammad Mohsin Khan	UNB	TBD	Master	Supervisor

Completed:

Period	Student/Researcher	Institution	Thesis/Project Title	Level	Role
2024/6 - 2025/8	Sai V. K. S. H. Emani	UNB	Reliable and extensible load forecasting tool	Master	Principal Supervisor
2024/6 - 2025/7	Parthin P. Reeja	UNB	Net load forecasting tool for Emera	Master	Supervisor
2025/5 – 2025/8	Elio Al Alam	UNB	Dynamic Thermal Rating of Transmission Lines	Undergraduate	Supervisor
2025/5 – 2025/8	Khaled K. S. Alhindi	UNB	Dynamic Thermal Rating of Transmission Lines	Undergraduate	Supervisor

2020/5 – 2022/8	Peter MacDonald	UNB	Smart Grid Simulation Platform	Undergraduate	Supervisor
2015/5 – 2015/8	Ryan MacDonald	UNB	Simulation of AMI Communications in Barbados	Undergraduate	Co-supervisor
2023/9 – 2024/9	Ahmad Mezher	UNB	Energy forecasting	Post-doctorate	Supervisor
2022/3 – 2024/12	Hao Yan	UNB	Modeling & Control of Residential Electrical Thermal Storage Units	Doctorate	Principal Supervisor
2024/6 – 2024/8	Mohammad M. Mohammadi	UNB	Dynamic Thermal Rating of Transmission Lines	Doctorate	Supervisor
2021/9 – 2023/12	Zahid Ali Khan	UNB	Centralized PV inverter control for LV networks	Master	Supervisor
2021/9 – 2024/12	Shafait Ahmed	UNB	Volt-Watt & Volt-Var Control for PV Overvoltage Mitigation	Master	Supervisor
2024/5 – 2024/8	Neel Mehulkumar Prajapati	UNB	Estimation of Transmission Line Parameters using Weather & Power Data	Master	Supervisor
2024/5 – 2024/8	Rahul Mittal	UNB	Optimal Design of Volt Var Control Rules using Deep Learning	Master	Supervisor
2024/6 – 2024/8	Leechita Gopalakrishnan	Crescent Institute of Sci. & Tech., India	Wind Power and Ramp Forecasting Tool	Mitacs Intern (Undergrad)	Supervisor
2023/9 – 2024/4	Mohammadreza Shafiee	UNB	Dynamic Spinning Reserve EMS for Microgrid Resilience	Master	Principal Supervisor
2021/3 – 2023/9	Afnan Rudabe Rahman	UNB	Minimization of Net-Load Variance via Smart EV Charging	Master	Supervisor
2023/6 – 2024/5	Taidy Diaz Guerra	UNB	Load Forecasting	Graduate RA	Supervisor
2023/10 – 2024/4	Daniel Ganta	UNB	Virtual real time platform for simulating and control of DERs	Work-Study RA	Supervisor
2020/11 – 2022/6	John Salama	UNB	Integration of forecasting and DER control in SJE DERMS system	Junior Research Eng.	Supervisor
2018/9 – 2023/9	Ahmad Mezher	UNB	Smart Grid Communications	Post-doctorate	Co-Supervisor
2023/4 – 2023/7	Anas Cherif	UNB	Wind Power Forecasting Tool	Mitacs Intern (Undergrad)	Supervisor
2023/5 – 2024/4	Siamak Shirmohammadi	UNB	Virtual Power Plant Technologies	Post-doctorate	Supervisor
2021/9 – 2022/9	Hossein Shokouhinejad	UNB	Control technologies for dispatching energy resources	Post-doctorate	Co-Supervisor
2021/5 – 2022/5	Juan Pablo Astudillo Leon	UNB	Simulation of wireless AMI networks	Post-doctorate	Co-Supervisor
2021/3 – 2022/7	Hossam Mosbah	UNB	Optimization of DERs for Peak Shaving Programs	Post-doctorate	Co-Supervisor
2018/9 – 2019/9	Boris Vega Lara	UNB	Aggregation of thermostatically controlled loads	Post-doctorate	Co-Supervisor
2015/1 – 2020/1	Xun Gong	UNB	Aggregated Load Forecast & Control with Thermostatically Controlled Loads	Doctorate	Co-Supervisor
2020/9 – 2022/6	Jonas Fernandes	UNB	Co-simulation of Power and Communication Networks	Master	Co-Supervisor
2020/9 – 2022/9	Hossein Goordazi	UNB	Managing Load Aggregations & Distributed Generation Resources	Master	Supervisor
2020/1 – 2022/3	Taidy Diaz Guerra	UNB	Load forecasting to implement smart grid functions	Master	Co-Supervisor
2019/9 – 2022/4	Manuel Mendoza Miranda	UNB	Dispatch Capacity Forecasting of DERs for Peak Shaving	Master	Co-Supervisor
2018/12 – 2022/5	Tolulope O. Olugbenga	UNB	Deep Learning for Electrical Load Forecasting	Master	Co-Supervisor

Total trainees supervised/co-supervised: 39

- **Post-doctorate**: **9** (4 as Supervisor, 5 as Co-Supervisor)
- **Doctorate**: **6** (5 as Supervisor, 1 as Co-Supervisor)
- **Master**: **19** (14 as Supervisor, 5 as Co-Supervisor)
- **Undergraduate**: **5** (4 as Supervisor, 1 as Co-Supervisor)
- **Graduate RA**: **2** (as Supervisor)
- **Mitacs Interns (Senior Undergraduate)**: **2** (all as Supervisor)

b) External Examiner for Ph.D. Thesis (identify University, date)

I have been actively involved as an external examiner, mainly in Cuba, while I was a member of the following committees

• National Board for Scientific Degrees in Electronics and Telecommunications, Cuban National Commission of Scientific Degrees, permanent member.	National level	2012-2015
• National Board for Scientific Degrees in Computing Sciences, Cuban National Commission of Scientific Degrees, Guest member with voice and vote.	National level	2008
• Academic Committee, PhD Program: Control Engineering and Computer Science, Faculty of Electrical Engineering, UCLV, Cuba, member.	Faculty level	2014-

4.8 Publication or Production of Books, Articles, Films, etc. that advance teaching effectiveness

1. Leyva, P., **Cárdenas, J.L**. et al. "La Microcomputadora en la enseñanza de la Matemática Numérica". Monografía, Editorial Feijoo, Universidad Central de Las Villas, Santa Clara, Cuba, 1986.

4.9 Awards or honours for Teaching

- Medal for the Cuban education. 2006
- Award for his/her teaching work, Universidad Cooperativa de Colombia, Colombia. 2008

4.10 Any Other Equivalent Accomplishments

SECTION 5: RESEARCH, SCHOLARLY OR CREATIVE ACTIVITY

Note: My publication strategy centers on trainee development:

- **Student-first authorship:** Trainees as first authors, building their independent research profiles
- **Supervisory role:** As corresponding/last author, I provide conceptual framing, methodology rigor, and industry problem definition (e.g., IEEE Trans. Smart Grid 2021)
- **Collaborative equity:** In cross-disciplinary work (e.g., IEEE Access 2024), authorship reflects writing contribution while ensuring technical credit via 'equal contribution' notations

5.1 Articles Published or Accepted for Publication in Refereed Journals (author (s), year, title, journal volume, all pages. For multiple authored works, the contribution of the candidate should be clearly indicated -- i.e. principal author, equal contribution.)

Legend: ** Post-doctoral fellow.
* Graduate Student.

1. **Rahimi, T., *Ahmed, S., **Cardenas-Barrera, J.**, & Diduch, C. (2025). Fairness-Oriented Volt–Watt Control Methods of PV Units for Over-Voltage Suppression in PV-Enriched Smart Cities. Smart Cities, 8(3), 88.
   Equal contribution. Supervisor role. Q1-journal
2. Saleh, S. A., *McSporran, E. C., **Cardenas Barrera, J. L.**, Castillo-Guerra, E., & Diduch, C. P. (2025). One-node method to implement smart grid functions using a battery storage system. IEEE Transactions on Industry Applications. Vol 61, Issue 4.
   Equal contribution. Supervisor role. Q1-journal
3. *Hojjatinia, Z., **Mezher, A. M., Castillo-Guerra, E., **Cardenas-Barrera, J.**, & Saleh, S. M. (2024). Peak shaving impact on load forecasting: A strategy for mitigation. IEEE Access, vol. 12.
   Equal contribution. Supervisor role. Q1-journal
4. *Duenas Santos, C. L., **Mezher, A. M., **Astudillo León, J. P., **Cardenas Barrera, J.,** Castillo Guerra, E., & Meng, J. (2024). Q-RPL: Q-learning-based routing protocol for advanced metering infrastructure in smart grids. Sensors, 24(15), 4818.
   Equal contribution. Supervisor role. Q1-journal
5. Saleh, S. A., *McSporran, E. C., **Cardenas Barrera, J. L.**, Castillo-Guerra, E., & Diduch, C. P. (2024). The one-node approach to implement smart grid functions for residential loads. IEEE Transactions on Industry Applications. Vol. 60, Issue 6.
   Equal contribution. Supervisor role. Q1-journal
6. *Arafat, I.; **Shokouhinejad, H.; Castillo Guerra, E.; Meng, J; **Cardenas-Barrera, J.L**. (2024). Maximum Reserved Capacity of Aggregated Electric Water Heaters Virtual Battery for Peak Management. *IEEE Access*, vol. 12, pp. 67574-67588, doi: 10.1109/ACCESS.2024.3391298
   Equal contribution. Supervisor role. Q1-journal

7. Saleh, S.A.; *Zundel, E. W. ; Young-Morris, G.; Meng, J.; Cardenas, J.;Hill, E. F. S.; Brown, S. (2024). Impacts of Transformer Loading on the Harmonic Distortion Created by GIC Flows. IEEE Transactions on Industry Applications. : 1-11.

Equal contribution. Supervisor role. Q1-journal

8. **Mezher, A.M.; *Dueñas Santos, **C.L.; Astudillo Leon, J.L; **Cardenas-Barrera, J.L**; Meng, J.; Castillo-Guerra, E. (2024) Exploring model transferability in ML-integrated RPL routing for smart grid communication: A comparative analysis across urban scenarios. Ad Hoc Networks; 164 ():.

Equal contribution. Supervisor role. Q1-journal

9. **Astudillo Leon, J.P.; *Duenas Santos, C.L.; **Mezher, A.; **Cardenas Barrera, J.L.**; Meng, J.; Castillo Guerra, E. (2023). Exploring the potential, limitations, and future directions of wireless technologies in smart grid networks: A comparative analysis. Computer Networks. Volume 235, November 2023

Equal contribution. Supervisor role. Q1-journal

10. *Duenas Santos, C.L.; **Mezher, A.; **Astudillo Leon, J.P.; **Cardenas Barrera, J.L.**; Castillo Guerra, E.; Meng, J. (2023). ML-RPL: Machine Learning-based routing protocol for Wireless Smart Grid Networks. IEEE Access vol. 11.

Equal contribution. Supervisor role. Q1-journal.

11. **Mosbah, Hossam; Castillo Guerra, Eduardo; **Cardenas Barrera, Julian L.** (2022). Maximizing the electricity cost-savings for local distribution system using a new peak-shaving approach based on mixed integer linear programming. Electronics. 11(21:3610)

Equal contribution. Supervisor role. Q2-journal

12. Saleh ,S. A.; *Jewett , D.; Al-Durra, A.; Kanukollu, S.; **Cardenas, J.**; Valdes, M. E.; Panetta, S. A. R. (2022). Evaluating the Impacts of Grounding Systems on Ground Currents and Transient Over-Voltage. IEEE Transactions on Industry Applications

Equal contribution. Supervisor role. Q1-journal

13. Saleh, S. *A.; Jewett , D.; Al-Durra, A.; Kanukollu, S.; **Cardenas, J.**; Valdes, M. E.; Meng, J.; Panetta, S. A. R. (2022). Experimental Assessment of Grounding System Impacts on Ground Currents and Transient Over-Voltage. IEEE Transactions on Industry Applications.

Equal contribution. Supervisor role. Q1-journal

14. Saleh, S.A.;*Ahshan, R.; Haj-Ahmed, M.; **Cardenas-Barrera, J.L.**; Meng, J. and Castillo-Guerra, E. (2022). Energy Not-Served-Based Method for Assessing Smart Grid Functions in Residential Loads. IEEE Transactions on Industry Applications. 58(2): 1720-1729.

Equal contribution. Supervisor role. Q1-journal

15. *Chowdhury, M.R.A. and Saleh, S.A. and *Betancourt, O.A. and **Cardenas-Barrera, J.L.** and Castillo-Guerra, E. (2022). Employing Battery Storage Systems to Improve Power System Survivability. IEEE Transactions on Industry Applications. 58(2): 1858-1868.

Equal contribution. Supervisor role. Q1-journal

16. *Gong, X. and Castillo-Guerra, E. and **Cardenas-Barrera, J.L.** and Cao, B. and Saleh, S.A. and Chang, L. (2021). Robust Hierarchical Control Mechanism for Aggregated Thermostatically Controlled Loads. IEEE Transactions on Smart Grid. 12(1): 453-467.

Equal contribution. Supervisor role. Q1-journal

17. Saleh, S.A. and **Cardenas-Barrera, J.L.** and Castillo-Guerra, E. and Meng, J. and Alsayid, B. and Chang, L. (2021). Planning Smart Grid Functions in Residential Loads Using a Virtual Equivalent Battery Storage Unit. IEEE Transactions on Industry Applications. 57(5): 4441-4455.

Equal contribution. Non-supervisory role. Q1-journal

18. **Mezher, A.M. and *Rivera, P.E.I. and **Cárdenas-Barrera, J.** and Meng, J. and Guerra, E.C. (2020). Efficient strategy to optimize key devices positions in large-scale RF mesh networks. Ad Hoc Networks. 106

Equal contribution. Supervisor role. Q1-journal

19. **Mohamad Mezher, A. and **Cárdenas-Barrera, J.** and *Rajendran, N. and Meng, J. and Castillo Guerra, E. (2019). Optimized routers positions for large-scale RF mesh networks based on clustering algorithms. Ad Hoc Networks. 93

Equal contribution. Supervisor role. Q1-journal

20. *R. Díaz-Amador, M. A. Mendoza-Reyes, and **J. L. Cárdenas-Barrera.** (2019). Reducing the effects of muscle fatigue on upper limb myoelectric control using adaptive LDA. Ing. Electrónica, Automática y Comun.40(2): 10-21.

Equal contribution. Supervisory role.

21. *Gong, X. and **Cardenas-Barrera, J.L.** and Castillo-Guerra, E. and Cao, B. and Saleh, S.A. and Chang, L. (2019). Bottom-Up Load Forecasting with Markov-Based Error Reduction Method for Aggregated Domestic Electric Water Heaters. IEEE Transactions on Industry Applications. 55(6): 6401-6413.

Equal contribution. Supervisor role. Q1-journal

22. *Sherwood, N., **J. L. Cardenas-Barrera**, E. Castillo-Guerra, and J. Meng. (2013). Using SNR Knowledge to Improve Noise-Robust Speech Recognition Normalization. International Journal of Electrical, Electronics & Computer Systems, vol. 16, issue 1 pp. 1-4.

Equal contribution. Supervision role.

23. **Cardenas-Barrera, J. L.**, E. Castillo-Guerra, J. Meng, and L. Chang, (2013). Multi-step-ahead, Short-Term Prediction of Wind Speed Using a Fusion Approach. Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications: Springer Berlin Heidelberg, pp. 83–91.
Principal autor.

24. *Bazán-Prieto, C., M. Blanco-Velasco, **J. L. Cardenas-Barrera**, and F. Cruz-Roldán. (2012). Retained energy-based coding for EEG signals, Medical Engineering & Physics, vol. 34, issue 7, pp. 892-899.
Equal contribution. Supervision role.

25. *Bazán-Prieto, C., M. Blanco-Velasco, **J. L. Cardenas-Barrera**, and F. Cruz-Roldán, (2012). Analysis of tractable distortion metrics for EEG compression applications. Physiological measurement, vol. 33, issue 7.
Equal contribution. Supervision role.

26. *Bazán-Prieto, C., M. Blanco-Velasco, **J. L. Cárdenas-Barrera**, and F. Cruz-Roldán, 2012. Compresión de señales electroencefalográficas epilépticas y normales. Revista de Ingeniería Electrónica, Automática y Comunicaciones, vol. 33, issue 1.
Equal contribution. Supervision role.

27. Eduardo Castillo-Guerra, **Julian L. Cárdenas-Barrera** and *Roberto Diaz-Amador, (2008). Adaptive Re-estimation of Speaker Verification Threshold, Proceedings of Meetings on Acoustics (POMA), Vol. 4, No. 5, Pt. 2, p. 060002. © American Institute of Physics, N.Y.
Equal contribution. Supervision role.

28. Eduardo Castillo-Guerra, **Julian L. Cardenas-Barrera**, *Roberto Diaz-Amador, (2008). Adaptive Threshold Estimation for Speaker Verification, Acta Acustica united with Acustica, Vol. 94, Suplement 1, pp. S909. ISSN 1610-1928, © S. Hirzel Verlag Stuttgart.
Equal contribution. Supervision role.

29. Eduardo Castillo-Guerra, **Julian L. Cárdenas-Barrera** and *Roberto Diaz-Amador, (2008). Adaptive Threshold Estimation for Speaker Verification", J. Acoust. Soc. Am., Vol. 123, No. 5, Pt. 2, pp. 3877. ISSN 0001-4966, © American Institute of Physics, N.Y.
Equal contribution. Supervision role.

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Principal author. Equal contribution.

5.2 Refereed conference proceedings

1. **Cardenas Barrera, J.L**., "Forecast-Informed Dynamic Operating Envelopes: From IEEE 1547 Interoperability to DERMS/VPP Operations," **Tutorial session** submitted to 2026 IEEE Power & Energy Society (PES) International Meeting (IM), Hong Kong SAR, China, January 18- 21, 2026.

Tutorial session.

2. **Cardenas Barrera, J.L**., "Topic: Robust Intelligent Renewable Integrated Power Grids," **Invited Speaker**. 2025 the 12th International Conference on Power and Energy Systems Engineering (CPESE2025), Fukuoka, Japan. September 12-14, 2025.

Invited Speaker

3. **Cardenas Barrera, J.L**., "Advancing Wind Power Forecasting for Reliable Grid Integration: Challenges, Methods, and Emerging Trends," Spring 2025 Canadian Wind Energy Research Network (CWERN), Halifax, Canada, April 29-30, 2025.

Invited Speaker.

4. *Cherif, A; **Cardenas Barrera, J.L.**, **Rahimi, T. (2025). Advanced Forecasting Techniques for Wind Power Generation: Enhancing Grid Stability and Efficiency. 2025 IEEE the 13th International Conference on Smart Energy Grid Engineering (SEGE 2025), Oshawa, Canada

Equal contribution. Supervisor role.

5. *Das, B.; **Cardenas Barrera, J.L.**; Allan, B. (2025). Long-term Provincial Load Forecasting In the Context of DERs: A Hybrid Approach. 2025 IEEE the 13th International Conference on Smart Energy Grid Engineering (SEGE 2025), Oshawa, Canada

Equal contribution. Supervisor role.

6. *W. F. Durdana, **T. Rahimi and **J. L. Cardenas Barrera**, "A Multi-Purpose Method for Sizing and Placement of Electric Vehicle Charging Stations in Urban Areas," *2025 IEEE 34th International Symposium on Industrial Electronics (ISIE)*, Toronto, ON, Canada, 2025, pp. 1-6, doi: 10.1109/ISIE62713.2025.11124733.

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Equal contribution. Supervisor role.

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Equal contribution. Supervisor role.

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Equal contribution.

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Equal contribution. Supervision role.

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Equal contribution. Supervision role.

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58. *Lara, B., and **J. L. Cárdenas-Barrera**, "Sistema Integrado de Familiarización, acceso remoto y supervisión basado en tecnologías web para el clúster de computadoras de la UCLV", XII Simposio de Ingeniería Eléctrica, Universidad Central Marta Abreu de Las Villas, 06/2005.

Equal contribution. Supervision role.

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Principal author.

63. **Cárdenas-Barrera, J. L.**, "Compresión de datos en estudios de sueño", Informática en Salud, Santa Clara. Cuba. June 1999.

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Principal author.

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Principal author.

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Principal author.

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Principal author.

70. **Cárdenas-Barrera, J. L.**, "Coprocesador para procesamiento digital de señales en computadores IBM XT/AT (Nueva Versión)", VIII Forum Nacional de Ciencia y Técnica, Santa Clara, Cuba, 09/1993.

Principal author.

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Principal author.

72. **Cárdenas-Barrera, J. L.**, "Sistema Monitor-Simulador para el procesador de señales TMS32010", II Coloquio sobre procesamiento digital de señales.Santa Clara, Cuba, 02/1992.

Principal author.

73. **Cárdenas-Barrera, J. L.**, "Sistema de Reconocimiento del Habla", I Coloquio sobre procesamiento digital de señales, Santa Clara, Cuba, 03/1990.

Principal author.

74. **Cárdenas-Barrera, J. L.**, "Síntesis de voz con el SP1000", II Simposio de Electrónica y Automatización, Santa Clara, Cuba, 1989.

Principal author.

5.3 a) Books
b) Part(s) of Books

5.4 Editorial Responsibilities (include title of book or journal and dates)

- Associate Editor.
  IEEE IAS Publications,
  Journals: **IEEE Transactions on Industry Applications, Open Journal of Industry Applications**
  Dates**: 2023 –**

- Guest editor.
  Journal**: Energies (ISSN 1996-1073)**
  Special Issue**: Operator-Grade Integrated Energy Storage: Interoperability and Storage-as-Transmission-Asset**
  Dates**: 2025-2026 (to be announced)**

- Guest editor.
  Journal**: Energies (ISSN 1996-1073)**
  Special Issue**: Data Mining Approaches for Smart Grids**
  Dates**: 2023-2025**

- Guest editor.
  Journal**: Electronics (ISSN 2079-9292)**
  Special Issue**: Smart Grids Technology and Its Applications**
  Dates**: 2022-2023**

- Program committee member.
  PEWASUN.
  The 15th, 16th,17th, 18th, ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor and Ubiquitous Networks.
  Dates**: 2017-2021**

- Program committee member.
  CLAIB.
  The VI, VII, Latin American Conference on Biomedical Engineering.
  Dates**: 2014-2016**

- Program committee member.
  SISICCI.
  2013-Special Issue of the II International Conference on Informatics and Computer Science.
  2011-Special Issue Machine Learning and Pattern Recognition.
  Dates**: 2010-2013**

- Program committee member.
  RECPAT, SIRECPAT.
  Cuban National Congress on Pattern Recognition 2010.
  Dates**: 2009-2010**

- Program committee member.
  Symposium of Electrical Engineering.
  XII- XIV editions.
  Dates**: 2005-2011**

Peer Review

- IEEE IAS Publications 2025,2024, 2023, 2022, 2021, 2020
- IEEE Transactions on Industrial Informatics. 2025,2023, 2022, 2021, 2019
- IEEE Transactions on Smart Grid 2025
- IET Energy Systems Integration 2025
- Sensors 2023
- IEEE Open Journal of Signal Processing 2023
- IETE Journal of Research 2023
- Energies 2023
- Sustainable Energy, Grids and Networks 2023

- Computer Networks 2023
- Smart Science 2022
- Ad Hoc Networks 2022
- IEEE Access 2020
- PEWASUN. ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor and Ubiquitous Networks. 2023, 2022, 2021, 2019
- Computational Intelligence and Neuroscience. 2019
- IEEE Transactions on Circuits and Systems I: Regular Papers. 2016
- Program committee member. CLAIB 2016 VII Latin American Conference on Biomedical Engineering. 2016
- MECBME 2014. 2014 Middle East Conference on Biomedical Engineering. IEEE Engineering and Biology Society. 2014
- Reviewer and program committee member. CLAIB 2014. VI Latin American Conference on Biomedical Engineering. 2014
- Reviewer and program committee member. SICICCI 2013. Special Issue of the II International Conference on Informatics and Computer Science. 2013
- Reviewer and program committee member. sicicci2011. Special Issue Machine Learning and Pattern Recognition. 2011
- Reviewer and program committee member. SIRECPAT' 2010. Special Issue RECPAT' 2010. 2011
- Reviewer and program committee member. RECPAT-2010. 8th Cuban National Congress on Pattern Recognition 2010. 2010
- Biomedical Signal Processing and Control. Elsevier 2010
- Bioingeniería y Física Médica Cubana. Cuba. ISSN 1606-0563. 2007
- Medical & Biological Engineering & Computing. Springer. 2000
- Symposium of Electrical Engineering. IX- XVII editions. 1999-2017

5.5 Creative Accomplishments (films, novels, dance choreography, poems, etc.)

5.6 Non-Refereed Publications (Research reports, technical reports, reviews)

5.7 a) Manuscripts submitted
b) Manuscripts in preparation

5.8 Papers Presented at Professional and Technical Meetings (include meeting and paper titles, date and whether invited)

5.9 Presentation of Seminars, Clinics, Workshops (include sponsor and short description of activity)

5.10 Consulting Activities, Professional Services to Governmental, Professional and Industrial Associations, Educational Institutions, Granting Agencies, etc.
(Include refereeing of articles or books, and external refereeing of promotion cases.)

2018/2 - 2018/3 Consultant, Consulting for Industry
Group/Organization/Business Serviced: National Research Council of Canada Industrial Research Assistance Program
Target Stakeholder: Industry/Business-Small (<100 employees)
Outcome / Deliverable: Develop feasibility study and a work plan for implementing technology standards in a company's product.

5.11 Awards (Grants, Contracts, Fellowships) (Identify, date(s), title, agency, amount and duration. For joint awards, the contribution of the candidate should be clearly indicated.)

2022/9 - 2023/3 Probabilistic Wind Power Forecasting, Grant
Funding Sources: New Brunswick Innovation Foundation
AI Pre-Voucher
Total Funding - 20,000
Portion of Funding Received - 20,000
Funding Competitive?: No
Principal Applicant

2019/8 - 2022/7 Integrated Dispatchable Resources Control Systems for Peak Load Management in Local Electricity Distribution Networks, Grant
Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC)
Collaborative Research and Development
Total Funding - 1,526,080
Portion of Funding Received - 0
Funding Competitive?: Yes
Collaborator and Student Supervisor
Co-applicants : Dr. Chris Diduch; Dr. Julian Meng; Dr. Liuchen Chang;
Collaborators : Dr. Cardenas-Barrera, Dr. Bo Cao; Prof. Mary Kaye;
Principal Applicant : Dr. Eduardo Castillo-Guerra

2025/1 - 2027/1
Principal Applicant
Future-Proofing Power Grids: Dynamic Thermal Rating of Transmission Lines for Enhanced Capacity, Grant
Funding Sources: New Brunswick Innovation Foundation.
Research Assistantship Initiative
Total Funding - 45,000
Portion of Funding Received - 45,000
Funding Competitive? Yes

2022/9 - 2023/3
Principal Applicant
Probabilistic Wind Power Forecasting, Grant

Funding Sources: New Brunswick Innovation Foundation
AI Pre-Voucher
Total Funding - 20,000
Portion of Funding Received - 20,000
Funding Competitive? No

2019/9 - 2022/7
Co-investigator
Distributed Energy Resources R&D, Grant
Funding Sources: Atlantic Canada Opportunities Agency
Atlantic Innovation Fund
Total Funding - 2,856,767
Portion of Funding Received - 200,000
Funding Competitive?: Yes
Co-applicant : Dr. Chris Diduch; Dr. Eduardo Castillo-Guerra;
Co-investigator : Dr. Julian Meng; Dr. Saleh Saleh;
Principal Applicant : Dr. Liuchen Chang

2019/8 - 2022/7
Co-Investigator
Integrated Dispatchable Resources Control Systems for Peak Load Management in Local Electricity Distribution Networks, Grant
Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC)
Collaborative Research and Development
Total Funding - 1,526,080
Portion of Funding Received - 200,000
Funding Competitive?: Yes
Co-applicant : Dr. Chris Diduch; Dr. Julian Meng; Dr. Liuchen Chang;
Collaborator : Dr. Bo Cao; Prof. Mary Kaye;
Principal Applicant : Dr. Eduardo Castillo-Guerra

2018/10 - 2026/12 Atlantic Digital Grid, Grant
Funding Sources: EMERA, NB Power, SIEMENS, ACOA, MITACS
Total Funding - $8,437,765
Portion of Funding Received - $1,963,185
Funding Competitive? No
NB Power Industrial Research Chair for Smart Grid Technologies.
Theme 2 Leader and Student Supervisor
Theme 3 Co-leader and Student Supervisor

2018/1 - 2022/4 Wind Power forecasting algorithms and tool, Grant
Funding Sources: New Brunswick Innovation Foundation
Research Assistantship Initiative
Total Funding - 10,000
Portion of Funding Received - 10,000
Funding Competitive? Yes
Principal Applicant

2019/10 - 2022/2, Electric Load Forecasting and Control for smart grid operations, Grant
Funding Sources: New Brunswick Innovation Foundation

Research Assistantship Initiative
Total Funding - 24,000
Portion of Funding Received - 24,000
Funding Competitive? Yes
Principal Applicant

2016/9 - 2021/3 Distributed Energy Resources R&D, Grant
Funding Sources: EMERA
Total Funding - 1,000,000
Portion of Funding Received - 0
Funding Competitive? No
Co-applicant: Dr. Chris Diduch;
Collaborator and Student Supervisor
Principal Applicant: Dr. Liuchen Chang

2015/8 - 2020/8 Direct Load Control, Grant
Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD
Total Funding - 1,440,000
Portion of Funding Received - 0
Funding Competitive? Yes
Collaborator and Student Supervisor
Principal Applicant : Dr. Liuchen Chang

2015/7 - 2018/7 Smart Grid Research Laboratory, Grant
Funding Sources: Atlantic Canada Opportunities Agency
Total Funding - 2,000,000
Portion of Funding Received - 0
Funding Competitive? Yes
Collaborator and Student Supervisor
Principal Applicant : Dr. Liuchen Chang

5.12 Other Evidence of Research Accomplishments (patents, new product development)

Patents:

1. Cárdenas-Barrera, J. L., J. V. Lorenzo-Ginori, and E. Rodríguez-Valdivia, "Procedimiento digital para la compresión de la señal EEG", OCPI, vol. 22810, Cuba, 2002.
2. Cárdenas-Barrera, J. L., and J. V. Lorenzo-Ginori, "Compresión de señales ECG mediante cuantificación vectorial de su forma de onda", OCPI, vol. 22529, 1998.

5.13 Membership and Active Involvement in Professional and Learned Societies (include offices held, or other responsibilities)

2018/1 Member, Professional Engineering.
2023/6 Senior Member IEEE.
2023/6 Member Industry Applications Society. Associate Editor

5.14 Record of Pursuit of Advanced Degrees and/or Further Academic Study

SECTION 6: SERVICE

6.1 Service to the University

- Committees (list level, committee name, dates)

Department Committees:

- SWE Oversight Committee 2024 -
- CAE Assessment Committee. 2023 -
- Graduate Committee. 2022 -

Faculty Committees:

- Faculty Council Reps. 2023 - 2024

- Administrative Positions (list position, dates)
  - NB Power Industrial Research Chair in Smart Grid Technologies, Electrical and Computer Engineering, University of New Brunswick, 2022/5 -

6.2 Service outside the University of scholarly or academic significance

- Community Affairs as a Representative of the University
- Service to Governmental Agencies
- Service to Public or Private Organizations and Companies

• National Board for Scientific Degrees in Electronics and Telecommunications, Cuban National Commission of Scientific Degrees, permanent member.	National level	2012-2015
• National Board for Scientific Degrees in Computing Sciences, Cuban National Commission of Scientific Degrees, Guest member with voice and vote.	National level	2008
• Scientific Council, Faculty of Electrical Engineering, UCLV, Cuba, permanent member.	Faculty level	2008-2014
• Academic Committee, Master Program: Signals and Systems, Faculty of Electrical Engineering, UCLV, Cuba, member.	Faculty level	2009-2014
• Academic Committee, Master Program: Control Engineering, Faculty of Electrical Engineering, UCLV, Cuba, member.	Faculty level	2010-2014
• Academic Committee, PhD Program: Control Engineering and Computer Science, Faculty of Electrical Engineering, UCLV, Cuba, member.	Faculty level	2014-
• Hiring Board for academic positions, Faculty of Electrical Engineering, UCLV, Cuba, member.	Faculty level	2009-2014
• Library Committee, Biomedical Engineering undergraduate program, Faculty of Electrical Engineering, UCLV, Cuba, member.	Dept. level	2005-2010

SECTION 7: OTHER RELEVANT INFORMATION