

Jose Daniel Lara

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Education

PhD, Energy and Resources Group

University of California Berkeley 2018-Present

- Designated Emphasis in Computational and Data Science and Engineering.
- Coursework in optimization models and dynamic programming.
- Research topic: Modular Multi-Energy System Simulation and Analysis. Advisor: Daniel Kammen, PhD.

M.S Energy and Resources Group

University of California Berkeley 2015-2017

- Engineering and Business for Sustainability (EBS) Certified
- Coursework in microeconomics, financial engineering, energy markets interdisciplinary analysis of energy systems, risk and optimization.
- Thesis: Distributed biomass gasification to manage tree mortality in California. Advisor: Daniel Kammen, PhD.
- University of California, Office of the President Carbon Neutrality Initiative (CNI) Fellow.
- Affiliated grant: EPC-14-303 (Cleaner Energy: Converting Forest Fire Management Waste to On Demand Renewable Energy)

Master of Science (M.Sc.), Electrical and Computer Engineering

University of Waterloo 2012-2014

- Coursework in power system stability, control and operation, distribution systems engineering, intelligent system design, linear and numerical optimization.
- Thesis: Robust Energy Management Systems for Isolated Microgrids Under Uncertainty. Advisors: Claudio Cañizares, PhD and Kankar Battacharya, PhD
- Electrical & Computer Engineering Graduate Award Winter 2013, Spring 2013 (every term eligible)

Electrical Engineering Licenciata (Graduation with honors)

University of Costa Rica 2009-2010

- Accredited by the Canadian Engineering Accreditation Board (CEAB)
- Coursework in simulation and modeling, power flows, voltage stability, protections, grounding, power electronics, power system automation, and applied math.
- Thesis: Multi-objective Optimization of Distributed Hydro Generation in Distribution Networks. Advisor: Gustavo Valverde. PhD

Bachelor in Science (B.Sc.) Electrical Engineering

University of Costa Rica 2005-2009

- Program completed with focus in electric power and electrical machines. Additional coursework in Mechanical Engineering for credit.
- Graduation Project: Induction Motor AC Drive simulation for automotive propulsion application. Advisor: Victor Alfaro, PhD. Developed in collaboration with Dr. Bimal Bose.

Publications and Presentations

- Helistö, N; Kiviluoma, J; Holttinen, H; Lara, J.D.; Hodge, B-M; Das, K. "Combining planning and operational modelling in variable generation integration studies". Submitted to Sustainable Energy Reviews.
- Lara, J.D.; Olivares, D.E.; Canizares, C.A.; Kazerani, M., "Robust Energy Management System for Isolated Microgrids", accepted to IEEE Systems Journal March 2018.
- Lara, J.D.; Tubessing, C, Tittman, P.W.; Battles, J; Kammen, D. M. "Potential for electricity generation from woody biomass resulting from California's drought". Submitted to Nature Energy.
- Argüello A, Lara JD, Rojas JD, Valverde G. "Impact of Rooftop PV Integration in Distribution Systems Considering Socioeconomic Factors". IEEE Systems Journal. 2017 Aug 24.
- Olivares, D.E.; Lara, J.D.; Canizares, C.A.; Kazerani, M., "Stochastic-Predictive Energy Management System for Isolated Microgrids," in *IEEE Transactions on Smart Grid*, vol.6, no.6, pp.2681-2693, Nov. 2015
- Lara, J.D.; "Robust Energy Management System for Isolated Microgrids" Presented in the 10th International Symposium in Microgrids, Tianjin China, November 2014.
- Lara, J.D.; Nathwani, J., "Value of Electricity vs Cost - Resolving the customer benefit dichotomy in ratemaking" *The Electricity Journal*, Volume 27, Issue 6, July 2014, Pages 86-94.

- Lara, J. D.; Vieto, I., "Optimal Sizing of Static Converters for Single Phase Feeding of Three Phase Induction Motor" *XXth International Conference on Electrical Machines (ICEM'2012) France September 2012*

Professional Work Experience

National Renewable Energy Laboratory: Student Researcher

October 2017-Today

- Power Systems Design and Studies Group
- Integrated Electricity – Water Modeling.
- Development of a probabilistic forecast integration algorithms into Economic Dispatch Models.

Trama-Techno-Ambiental: Microgrid Scientific Specialist

August 2016-Today

- Provide technical advice on microgrid design, isolated power systems control and distributed energy integration.
- Recent projects include:
 - Energy storage solution design for PUB – Kiribati Public Utilities Board.
 - Technical standards for net metering in Lebanon – CEDRO project.
 - Microgrid Energy Management System (EMS) troubleshooting – MEDSolar.
 - Distributed solar PV and energy storage integration in the northwest province of Santa Fe Argentina.
 - Microgrid design revision and electric systems review in Eritrea, Europaid/138027/IH/SUP/ER: EUROP-ERITR-001.

National Renewable Energy Laboratory: Electrical Engineering Graduate III – (Development Program). June 2017-August 2017

- Electrical Engineer at the NREL's Energy Systems Integration Facility (ESIF).
- Development of a probabilistic forecast integration algorithms into Economic Dispatch Models.
- Implementation of Conditional Value at Risk models in Economic Dispatch.

Hatch LTD: Intermediate Electrical Engineer

September 2014-July 2015

- Team-member of Electro-technologies group, with focus on technology development.
- Developed a simulation platform to test mathematical models and apply optimization algorithms for real-time dispatch of electric power assets in remote microgrids on a cRIO-9068 platform.
- Participated in the development of new project prospecting and knowledge transfer to current Hatch employees for future maintenance of the developed products.

University of Waterloo: Research Associate ecoENERGY Innovation Initiative

August 2012-August 2014

- Developed a commercially viable, utility grade controller for islanded electric grids, with a focus on communal remote microgrids and distributed resources.
- Responsibilities included developing optimization algorithms suitable for real-time dispatch, implementation in hardware and coordination with industrial partner.

WISE - Waterloo Institute for Sustainable Energy Sustainable Energy Research Analyst May 2014-August 2014

- Performed primary research to examine the electricity cost and value data for improving regulatory decisions. Provide guidance and assistance to undergraduate research assistants as required.

Nissan Costa Rica: Nissan Leaf Project Engineer

July 2010-August 2012

- Research and development of the required platform for the implementation on the Nissan LEAF in Costa Rica, analysis of battery performance and charging standards.
- Design of level 2 charging stations for Electric Vehicles and preliminary analysis for level 3 charging

stations.

- Coordination with the electric utilities and governmental agencies regarding the deployment of the required technology and negotiation with Nissan headquarters for demonstration projects

Vara Blanca Micro-Hydro, Suerkata Micro-Hydro

July 2009-July 2010

- Commissioning of equipment, work force coordination, electromechanical equipment repair supervision, equipment testing.
- Technical interconnection studies for run of river hydro projects such as Unbalanced power flow analysis and short-circuit.

Trend Micro Costa Rica, Customer Support.

December 2004-December 2007

- Technical support to clients on antivirus and security related issues for business and enterprise.

Independent Engineering Consultant Projects:

Development of indicators for performance of utilities in Costa Rica

September 2016 – December 2016

Prepared for the Ministry of Environment and Energy of Costa Rica, aims to develop operational efficiency indicators to assess Costa Rica's electric utilities. The consulting project aims to provide regulators with measures to compare with other jurisdictions and inside the country.

Energy and the competitiveness of the manufacturing sector in Costa Rica

January 2016 – June 2016

Prepared for the chamber of industry. Evaluation of the effect of energy prices (Electricity and Hydrocarbon fuels) in the competitiveness of the manufacturing sector in Costa Rica. The analysis includes a price benchmark with several competing countries and a in depth analysis of the factors causing local high energy costs. The report also includes policy recommendations to address competitiveness issues related to energy.

Technical and financial analysis of distributed PV in Costa Rica's main utility

January 2015-August 2015

Prepared for the Ministry of Environment and Energy of Costa Rica with support of CRUSA foundation. It analyzed regulatory gaps and the interaction of social policies (subsidies) with new technologies generate a range of problems for utility companies when faced with user adoption of generation resources.

Project ED-2887: Analysis of the National High Voltage Grid in Costa Rica

June 2011-March 2012

Prepared for the National Controlling Authority, under the interest of evaluating the operational practices of the high voltage grid. The evaluation was made under FERC practices for steady state operation, including N-1, N-1-1 and N-n events in the local and Central American regional grid.

Client Vara Blanca Micro-Hydro, Suerkata Micro-Hydro

August 2010-July 2012

External consultant in the construction of Vara Blanca Hydro power plant and Suerkata Hydro operation. Projects developed: Monthly analysis and reporting of hydro stations availability, yearly production projections and operational status of the equipment. *Tariff Analysis for Vara Blanca Hydro. Grid Interconnection Analysis for Vara Blanca Hydro*


Other Activities

Volunteer activities.

- IEEE Power and Energy Systems society (since 2010)
- College of Natural Resources Advisory Board (since 2015)
- Undergraduate Research Advisor Berkeley Institute of Data Science (since 2016)
- Costa Rica Engineering Society Member (Since 2012).
- AIESEC (2008 – 2012) – Currently Alumni Status.

Relevant Independent Coursework and Certifications.

- 2009 Frederich Ebert Stiftung Costa Rica Agent for a Change Program certification.

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- 2011 Risk Management on Hydro Power by International Centre for Hydropower.
 - 2011 Environmental Management on the Tropics On-line Course *Denmark Technical University*
 - 2012 IEEE Smart Grid Technical Tutorial.
 - 2012 MITACS Foundations of Project Management I
 - 2014 MITACS Foundations of Project Management II
 - 2014 University of Waterloo Student Leadership Program
 - 2014 IEEE PES Boston Chapter Microgrid Course
 - 2014 NREL Energy Systems Integration Workshop