

Santiago Peñate Vera

Electrical Engineer

Experienced in the entire chain of value from R&D and product deployment, to consultancy. This includes but not limited to: Research, project management, product development, customer relations, proposal writing, and mentorship. Visit sanpv.com for full details.

Experience

- August 2019- **Engineer**, *Red Electrica de España*, Madrid-Spain.
 - Current
 - Spain's power system long term planning.
 - Tool development.
- November 2018- **Consultant**, *AF-Pöyry*, Madrid-Spain.
 - August 2019
 - Power systems long term planning (Worldwide)
 - Numerical calculations and algorithmic design.
- March 2017- **Consultant/Researcher**, *INDRA*, Madrid-Spain.
 - November 2018
 - Forecast and analytics.
 - Optimization systems development.
 - Numerical calculations and algorithmic design.
 - SCADA systems design (FLISR + Optimization)
 - Microgrids' control design and implementation.
- Nov 2015- **Consultant/Researcher**, *DNV GL*, Madrid-Spain.
 - March 2017
 - Reliability calculations for utilities.
 - Software for blackout estimation and market prices forecast.
 - SCADA evaluation.
- 2013–Nov 2015 **Researcher**, *DNV-GL*, The Netherlands.
 - Several European projects (EasyBat, NEMO, E+, VIMSEN)
 - Development of software for electrical grids optimization, forecast, reliability and co-simulation.
 - Students supervision.
- 2012–2013 **Engineer**, *3iDS (University spin-off)*, Spain.
 - Development of optimal dispatch software (Which property I own).
 - Study of the maximal renewable penetration in the island of Gran Canaria.

Currently in Gran Canaria – Spain

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Education

- 2020–2021 **MBA**, EAE and University of Barcelona, Thesis: Monetization of open source software.
- 2012–2013 **Master**, *Master in reliability and risk*, University of Las Palmas of Gran Canaria, Spain.
Thesis: Model for the definition of the expenditure in medium voltage grids according to the desired reliability, at Iberdrola+DNVGL.
- 2004–2011 **Engineering (5-year)**, *Industrial Engineering, Electric specialization*, University of Las Palmas of Gran Canaria, Spain.
Thesis: Longitudinal control of scaled electric vehicle.

Computer skills

- Programming Python, C#, C++, JAVA, Matlab, SQL.
- Tecnologies Machine learning (TensorFlow + Skit-Learn), Computer vision (OpenCV), multi-objective optimization, stochastic simulations.
- Specialized software Power Factory, PSS/e, OpenDSS, GridCal

Languages

- Spanish Native.
- English Usual language at work.

Affiliations and publications

- Affiliations IEEE (Power and Energy Society)
- Publications
- Power systems analysis, open source and the current challenges (IEEE-PES Masterclass, July 2021)
 - Sizing of wind, solar and storage facilities associated to a desalination plant using stochastic optimization (Lecture Notes in Computer Science 2017-Springer)
 - Mitigation of grid overloads and voltage deviations using storage, CIRED 2015, Lyon (France).
 - Bayesian estimation and machine learning in photovoltaic power production forecast, PVSEC 2014, Amsterdam (The Netherlands).
 - Methodology to determine the performance indicators of electrical grids that use backup elements, IEEE 2014, Ghent (Belgium).

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Selected experience

ENTSO-e bottom up Plexos modelling group leader

2020 **Engineer**, *Red Electrica de España*, Spain.

Description, Have been leading the bottom up scenario modelling in Plexos. Also designed the python API for Plexos to achieve efficient modelling from external sources.

Best R&D project

2020 **Engineer**, *Red Electrica de España*, Spain.

Description, Won the company best R&D project prize with a modular power systems solver, that today is enabling the AI strategy of the company (hence, the country) in electrical operation and planning..

Spain Long Term planning

2019 **Consultant**, *Red Electrica de España*, Spain.

Description, Long term planning of Spain's power system using power system optimization tools (PLEXOS) in conjunction with PSS/e.

Kazakhstan Long Term planning

2019 **Consultant**, *AF-Pöyry*, Spain.

Description, Long term planning of Kazakhstan's power system using power system optimization tools (InHouse) in conjunction with PowerFactory.

Mozambique-Zambia interconnection planning

2019 **Consultant**, *AF-Pöyry*, Spain.

Description, Feasibility study using power system optimization of the Mozambique-Zambia interconnection. Included modelling of the South African Power Pool (SAPP).

Micro grid control and calculation engine

2018 **Researcher-Consultant**, *INDRA*, Spain/Australia.

Description, Design of a calculation and control engine for the implementation of the smart-grid system at the Monash University in Melbourne (Australia).

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SCADA topological and calculation engine

2018 **Researcher-Consultant**, *INDRA*, Spain.

Description, SCADA system implementation project for KPLC, DSO of Kenya. Design and implementation of unbalanced three-phase calculation system.

SCADA economic dispatch

2017 **Researcher-Consultant**, *INDRA*, Spain.

Description, SCADA system implementation project for SEPS, the Slovak TSO. Design and implementation of the auxiliary services dispatch system.

FLISR system design

2017 **Researcher-Consultant**, *INDRA*, Spain.

Description, Design and implementation of the FLISR system (Fault Location Isolation and Service Restoration) for *INDRA*'s DMS system.

Electrical calculation software

2015-2018 **Ingeniero**, Spain.

Description, *GridCal*, Open source project for the design and implementation of electrical calculation software (power flow, short circuit, voltage collapse, stochastic calculation and network collapse).

Reliability improvement study

2016 **Researcher-Consultant**, *DNV GL*, Spain.

Description, Reliability improvement project for the electricity distributor CGE in Chile.

Blackout probability estimation software

2014-2016 **Researcher**, *DNV GL*, Spain/Netherlands.

Description, Internal R&D project to build a network simulator capable of estimating the probability of blackouts in a power grid.

Ancillary services price forecast

2016 **Researcher**, *DNV GL*, Spain.

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Description, Internal R&D project to build a secondary market price estimator. Made using LSTM neural networks.

Software to size storage coupled to renewable energy sources

2015 **Researcher**, *DNV GL*, The Netherlands.

Description, Project for the definition and construction of software to dimension batteries connected to the grid or to renewable facilities. Special emphasis in the case of the USA.

Software to size and dispatch storage in the grid

2013-2015 **Researcher**, *DNV GL*, The Netherlands.

Description, *PLATOS*, Project of the Electromobility program for the definition and construction of optimal location and sizing software for batteries in the electric network. In consortium with Fraunhofer ISE and EMD.

Short time horizon solar production forecast

2013-2015 **Researcher**, *DNV GL*, The Netherlands.

Description, National Dutch subsidized project for the construction of a software for predicting solar irradiation at intervals of less than 15 minutes, using distributed measurements taken from existing photovoltaic installations.

Economic dispatch of energy systems software

2012 **Researcher-Consultant**, *3iDS*, Spain.

Description, Government of the Canary Islands project for the calculation of the amount of eligible renewables in the electricity system of Gran Canaria with stability guarantee.

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