

José Ricardo Santos Andrade

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Porto • Portugal



Experience

INESC TEC - Institute for Systems and Computer Engineering, Technology and Science

Center of Power and Energy Systems (CPES)

- Research Assistant @ Energy Analytics and Forecasting Unit **July 2016 – July 2018**
- Researcher @ Energy Analytics and Forecasting Unit **July 2018 – Present**

Projects:

- ***InteGrid*** - *Demonstration of INTElligent grid technologies for renewables INTEgration and INTEractive consumer participation enabling INTEroperable market solutions and INTErconnected stakeholders*

Task(s):

- Conceptualization, implementation, integration and coordination of project forecasting system(s) for Medium Voltage and Low Voltage network resources

Contribution(s):

- Exploration and exploitation of multiple algorithms for short-term (up to 48 hours ahead) forecasting of load and renewable energy (wind/solar) medium voltage resources, and Iberian Electricity Market (MIBEL) energy prices
- Conceptualization and implementation of a centralized database to support the forecasting system(s)
- Conceptualization and implementation of RESTful API's for measurements data ingestion and forecasts retrieval by external clients
- Participation in the development of weather data acquisition (measurements and numerical weather predictions) software, from multiple weather providers
- Demonstration of forecasting system(s) in real operational environments
- Paper publication(s) in international peer-reviewed journal

- ***CORAL*** - *Sustainable Ocean Exploitation: Tools and Sensors*

Task(s):

- Fundamental research with regard to innovative feature engineering techniques applied to renewable energy sources forecasting
- State of art research with regard to offshore energy conversion technologies and future hybrid systems opportunities

Contribution(s):

- Design and implementation of a multi-temporal energy management tool - formulated as a mixed-integer linear programming (MILP) problem - supported by forecasting algorithms and capable of defining the best operational strategy for the energy storage/consumption of envisioned maritime exploratory processes
- Paper publication in international peer-reviewed journal

Education

FEUP - Faculdade de Engenharia da Universidade do Porto

2010–2016

M.Sc. DEGREE IN ELECTRICAL AND COMPUTER SCIENCE ENGINEERING

Specialization in Renewable Energy

- Dissertation - Previsão de Variabilidade de Produção em Centrais Fotovoltáicas ¹
 - Classification: 19 (in a scale of 1 to 20)

Academia de Música de São João da Madeira

1998–2010

BEGINNER - ADVANCED MUSICAL EDUCATION & PIANO CLASSES

Awards and Honors

EEM2016 - COMPLATT - Energy Price Forecast Competition

April 2017

International competition² with the demanding exercise of forecasting the Iberian Electricity Market (MIBEL) hourly spot energy price up to 120 hours ahead. In a rolling basis fashion, forecasts were submitted over a period of 14 days. A weighted mean absolute error metric was used to evaluate the forecasts of each participant.

- Final Classification: 4th place (44 participants at final stage)

INESC TEC BIP - "Fora de Série" / Limelight

May 2017

Monthly award that honors collaborators for an exceptional contribution in his/her area of activity. More information available at BIP Bulletin INESC TEC ³.

Key Skills

- **Natural Languages:** Portuguese and English proficient.
- **Programming Languages:** Python (advanced); L^AT_EX(intermediate); JavaScript, GoLang (home projects); R, MATLAB, C, C++ (academic)
 - **Daily drivers:** pandas, numpy, scipy, scikit-learn, statsmodels, keras, seaborn, dash & plotly, sphinx
- **Databases:** PostgreSQL (+TimescaleDB), Apache Cassandra, SQLite
- **Version control:** Git, GitHub/GitLab
- **App/Web Servers/Message Brokers:** NGINX, Apache, Flask, Django-REST Framework, RabbitMQ
- **Virtualization:** Docker (containerization), Oracle VM VirtualBox
- **IDEs:** JetBrains PyCharm/WebStorm, Visual Studio Code, RStudio, pgAdmin, DataStax Devcenter, Texmaker/TeXStudio
- **Platforms:** Linux, Windows
- **General Software:** Microsoft Office Suite, Mendeley, FileZilla, Terminus, Putty, Panoply

¹<https://repositorio-aberto.up.pt/handle/10216/82786>

²<http://complatt.smartwatt.net/>

³<http://bip.inesctec.pt/en/184/fora-de-serie.html>

Publications

1. Andrade, J.; Bessa, R. (2017). Improving renewable energy forecasting with a grid of numerical weather predictions. *IEEE Trans. Sustain. Energy* 2017, 8, 1571–1580.
2. Andrade, J.; Filipe, J.; Reis, M.; and Bessa, R. (2017). Probabilistic Price Forecasting for Day-Ahead and Intraday Markets: Beyond the Statistical Model. *Sustainability*, vol. 9, no. 11, p. 1990, Oct. 2017.
3. R.J. Bessa, D. Rua, C. Abreu, P. Machado, J.R. Andrade, R. Pinto, C. Gonçalves, and M. Reis, "Data economy for prosumers in a smart grid ecosystem," in *Proc. of the e-Energy '18: The Ninth International Conference on Future Energy Systems*, June 12–15, 2018, Karlsruhe, Germany.
4. A. Coronati, J.R. Andrade, R.J. Bessa, "A deep learning method for forecasting residual market curves," Working Paper, 2019.