José Ricardo Santos Andrade

jrsa2012@gmail.com

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):

  – Conceptualization and implementation of a centralized database to support the forecasting system
  – Conceptualization and implementation of RESTful API's for measurements data ingestion and forecasts retrieval by external clients
  – 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
  – 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 on 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 competition[2] 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: 4^{th} 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); LaTeX(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 Nineth 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.