Raphael Fortulan

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SUMMARY

Electrical and Electronic Engineer with PhD and 6+ years of experience in electronics, strong hands-on experience in Machine Learning and data science for modelling, signal processing, and experimental systems, including building end-to-end ML pipelines in Python and MATLAB.

WORK EXPERIENCE

University of Huddersfield **Feb. 2025 – Present**
Lecturer in Electrical and Electronic Engineering *Huddersfield, UK*

- Designed experimental pipelines for collecting, cleaning, and analysing measurement data.
- Appliede machine learning for system identification and predictive modelling.
- Build signal-processing workflows for experimental sensor data.
- Integrate physical device measurements with computational analytics. Collaborated across disciplines to translate findings into clear reports and presentations for diverse stakeholders.
- Contributed to experimental study design and data analysis pipelines aligned with UK research governance and quality assurance standards.

University of the West of England **Sep. 2023 – Feb. 2025**
Research Associate *Bristol, UK*

- Designed electronic measurement systems generating large experimental datasets.
- Applied machine learning to model nonlinear electronic and memristive device behaviour.
- Built predictive models linking electrical inputs to physical system responses.
- Implemented data pipelines for experimental analysis and model validation.

Materials and Engineering Research Institute, Sheffield Hallam University **Sep. 2020 – Sep. 2023**
Researcher *Sheffield, UK*

- Collaborated internationally to design thermoelectric materials for room temperature applications.

Institute of Systems and Robotics, University of Coimbra **Aug. 2019 – Aug. 2020**
Machine Learning Researcher *Coimbra, Portugal*

- Developed machine learning models for electrical load classification and prediction.
- Designed data acquisition systems for power consumption monitoring.
- Processed time-series electrical signals for pattern recognition.

EDUCATION

Sheffield Hallam University **Mar., 2024**
PhD in Materials Science *Sheffield, UK*

- Funded by Marie Skłodowska-Curie COFUND
- Thesis: Developing High-Efficiency Multiphase Thermoelectric Materials
- Techniques used included SEM, XRD, Raman spectroscopy, and thermal/electrical characterisation
- Analysed large experimental datasets from semiconductor and thermoelectric devices.
- Built regression and statistical models to correlate material properties with electrical performance.
- Automated data processing for electrical and thermal characterisation of semiconductor materials.

University of São Paulo **Mar., 2019**
Master's in Electrical Engineering *São Carlos, Brazil*

- Built and validated simulation models for large-scale power systems.

University of São Paulo **Jul., 2016**
Bachelor in Electrical Engineering *São Carlos, Brazil*

- Core areas: electronics, control, and signal processing

CERTIFICATIONS & SKILLS

- **Certifications:** Associate Member Royal Society of Chemistry
- **Skills:** Experimental design and study planning; hypothesis testing and statistical inference; regression and multivariate modelling; machine learning for prediction and pattern identification; statistical analysis of biomedical and experimental data; model validation; Python, R, MATLAB.

SELECTED PUBLICATIONS

- **Fortulan, R.**, Kheirabadi, N. R., Browner, D., Chiolerio, A., Adamatzky, A.
  Sustainable reservoir computing with liquid egg albumen. **Journal of Materials Chemistry C**, 2025.
  (Statistical analysis and machine-learning–based modelling of bio-derived experimental systems.)
- **Fortulan, R.**, Raeisi Kheirabadi, N., Chiolerio, A., Adamatzky, A.
  Thermal colloid programming. **Scientific Reports**, 2025.
  (Hypothesis-driven experimental design, multivariate data analysis, and statistical validation.)
- Haverson, K., Smith, R., Shenfield, A., **Fortulan, R.**, et al.
  A ResNeXt50-based convolution neural network for classification tasks. **Il Nuovo Cimento**, 2024.
  (Machine learning, predictive modelling, and performance evaluation.)
- **Fortulan, R.**, Kheirabadi, N. R., Raeisi-Kheirabadi, N., Nezamzadeh-Ejhieh, A., Chiolerio, A., Adamatzky, A.
  Fractional-order memristive dynamics in colloidal systems. **Physical Review E**, 2024.
  (Statistical modelling of dynamic systems, parameter estimation, and model validation.)