Jethro Browell

(formerly Jethro Dowell) **Curriculum Vitae**

Address:	Technology and Innovation Centre 99 George Street Glasgow, G1 1RD, UK	Tel: Mob: Email:	+44 (0) 141 444 7297 +44 (0) 79636 22 777 jethro.browell@strath.ac.uk
DOB:	18/02/1989	Web:	www.jethrobrowell.com

Positions

University of Strathclyde, Glasgow, UK.

2017– *Research Fellow, Dept. Electronic and Electrical Engineering*

- EPSRC-UKRI Innovation Fellow, 2018–2021.
- Research in mathematical modelling for energy systems, primarily energy forecasting and associated decision-making.
- Principal and Co-Investigator roles on research and knowledge exchange projects, grant writing and managing research assistants.
- Teaching and supervision at BSc, MSc and PhD level, and development of on-line courses.

2015–2017 *Research Associate, Dept. Electronic and Electrical Engineering*

- Research in mathematical modelling for energy systems, primarily energy forecasting and associated decision-making.
- Research management including co-instigator roles, grant writing and managing research assistants.
- Teaching and supervision at BSc, MSc and PhD level.

Education

Degrees

2011–2015 *University of Strathclyde, Glasgow, UK.*
PhD: *"Spatio-temporal Prediction of Wind Fields."*
Supervisors: Dr Stephan Weiss and Prof David Infield.
Structure: '1+3' EPSRC Centre for Doctoral Training.
Three months as a visiting researcher at the Technical University of Denmark.

2007–2011 *University of St Andrews, UK.*
MPhys (Hons), 2:1, Mathematics and Theoretical Physics.

Master's Research Project: *"Magnetic Fields Containing Two Null Points and a Separator."*
Cedric Thorpe Davie Award for contribution to University musical life.

Publications

Metrics Google Scholar: Citations 144, h-index: 6
Scopus: Citations (excluding self-cite): 67, h-index: 4
jethrobrowell.com: >600 unique visitors per-month

In Prep.

1. **J. Browell**, D. McMilland and M. Revie, "Scheduling Major Wind Turbine Component Replacements subject to Weather Risk using Real Options," 2017, *Working Paper*.
2. C. Gilbert, **J. Browell** and D. McMillan, "Probabilistic Wind Power Forecasting using Turbine-level Data: A Big Data Approach," 2017, *Working Paper*.
3. A. Papakonstantinou, **J. Browell** and P. Pinson, "Population Dynamics for Traders in Electricity Markets," 2017, *Working Paper*.
4. **J. Browell**, B-M. S. Hodge and T. Elgindy, "Modelling Dynamic Covariance Structures for Solar Power Scenario Forecasting," 2017, *Working Paper*.

Journal

1. **J. Browell**, D. R. Drew and K. Philippopoulos, "Improved Very-short-term Spatio-temporal Wind Forecasting using Atmospheric Regimes," *Wind Energy*, In Press, DOI: 10.1002/we.2207, 2018.
2. **J. Browell**, "Risk Constrained Trading Strategies for Stochastic Generation with a Single-Price Balancing Market," *Energies*, 11(6):1345, DOI: 10.3390/en11061345, 2018.
3. R. J. Bessa, C. Möhrlen, V. Fundel, M. Siefert, **J. Browell**, S. H. El Gaidi, B-M. S. Hodge, U. Cali, "Towards Improved Understanding of the Applicability of Uncertainty Forecasts in Wind Energy," *Energies*, 10(9):1402, DOI: 10.3390/en10091402. 2017.
4. A. Malvaldi, S. Weiss, D. Infield, **J. Browell**, P. Leahy, A. Foley, "A spatial and temporal correlation analysis of aggregate wind power in an ideally interconnected Europe," *Wind Energy*, 20(8), 1315–1329, DOI: 10.1002/we.2095, 2017.
5. L. Cavalcante, R. J. Bessa, M. Reis and **J. Browell**, "Sparse Structures for Very Short-term Wind Power Forecasting," *Wind Energy*, 20(4), 657–675, DOI: 10.1002/we.2029, 2017.
6. **J. Dowell**, P. Pinson, "Very-short-term Probabilistic Wind Power Forecasts by Sparse Vector Autoregression," *IEEE Transactions on Smart Grid*, 7(2), pp. 763–770, DOI: 10.1109/TSG.2015.2424078, 2016.
7. V. M. Catterson, D. McMillan, I. Dinwoodie, M. Revie, **J. Dowell**, J. Quigley, K. Wilson, "An economic impact metric for evaluating wave height forecasters for offshore wind maintenance access," *Wind Energy*, 19(2), pp. 199–212, DOI: 10.1002/we.1826, 2015.
8. **J. Dowell**, S. Weiss, D. Hill, D. Infield, "Short-Term Spatio-Temporal Prediction of Wind Speed and Direction," *Wind Energy*, 17(12), pp. 1945–1955, DOI: 10.1002/we.1682 2014.

In Book

1. R. Bessa, **J. Dowell**, P. Pinson, "Renewable Energy Forecasting," in the Smart Grid Handbook, edited by C-C. Liu, S. McArthur and S-J. Lee, Chichester, UK: John Wiley & Sons Ltd, ISBN: 978-1-118-75548-8, 1900 pages, Chapter: 639–659, 2016.

Conference

1. C. Gilbert, **J. Browell** and D. McMillan, "A Hierarchical Approach to Probabilistic Wind Power Forecasting," Probabilistic Methods Applied to Power Systems (PMAPS), Boise, Idaho, 2018, *accepted*.
2. **J. Browell** and C. Gilbert*, "Cluster-based Regime-switching AR for the EEM Wind Power Forecasting Competition," 14th International Conference on the European Energy Market (EEM), Dresden, Germany, post-print available online, 2017. **Invited Paper**
3. **J. Browell***, C. Gilbert and D. McMillan, "Use of Turbine-level Data for Improved Wind Power Forecasting", IEEE PowerTech, Manchester, UK, post-print available online, 2017.
4. **J. Dowell***, I. Dinwoodie and D. McMillan, "Forecasting for Offshore Maintenance Scheduling under Uncertainty", European Safety and Reliability Conference, Glasgow, UK, DOI: 10.1201/9781315374987-171 2016.
5. **J. Dowell***, G. Hawker, K. Bell and S. Gill, "Review of Probabilistic Methods of Defining Reserve Requirements," IEEE PES General Meeting, Boston, MA, DOI: 10.1109/PESGM.2016.7741361, 2016.
6. A. Malvaldi*, **J. Dowell**, S. Weiss, D. Infield, "Short-Term Forecasting of Wind Speed and Direction Exploiting Data Non-Stationarity," International Work-Conference on Time Series, Granada, Spain, 2015
7. **J. Dowell***, S. Weiss, D. Infield, "Kernel Methods for Short-term Spatio-temporal Wind Prediction," IEEE PES General Meeting, Denver, CO, DOI: 10.1109/PESGM.2015.7285965, 2015.
8. **J. Dowell***, S. Weiss, D. Infield, "Spatio-Temporal Prediction of Wind Speed and Direction by Continuous Directional Regime," Probabilistic Methods Applied to Power Systems, Durham, UK, DOI: 10.1109/PMAPS.2014.6960596, 2014. **Outstanding Student Paper Award**
9. **J. Dowell***, S. Weiss, D. Infield, S. Chandna, "A Widely Linear Multichannel Wiener Filter for Wind Prediction," IEEE Statistical Signal Processing Workshop, Gold Coast, Australia, DOI: 10.1109/SSP.2014.6884567, 2014.
10. A. Malvaldi*, **J. Dowell**, S. Weiss, D. Infield, D. Hill, "Wind Prediction Enhancement by Supplementing Measurements with Numerical Weather Prediction Now-Casts," EAWE 10th PhD Seminar on Wind Energy in Europe, 2014.
11. **J. Dowell***, S. Weiss, "Short-Term Prediction Using an Ensemble of Particle Swarm Optimised FIR Filters," IET Conference on Intelligent Signal Processing, London, 2013.
12. **J. Dowell***, A. Zitrou, L. Walls, T. Bedford, D. Infield, "Analysis of Wind and Wave Data to Assess Maintenance Access to Offshore Wind Farms," European Safety and Reliability Association Conference, Amsterdam, ISBN: 9781138001237, 2013.
13. H. Macdonald*, **J. Dowell**, S. Weiss, D. Infield, D. Hill, "Wind Prediction Enhancement by Environmental Parameters," Proceedings of the 9th PhD Seminar on Wind Energy in Europe, EAWE, 2013.

14. **J. Dowell***, S. Weiss, D. Hill, D. Infield, "A Cyclo-stationary Complex Multichannel Wiener Filter for the Prediction of Wind Speed and Direction," European Signal and Image Processing Conference, Marrakech, E-ISSN: 2076-1465 2013.
15. **J. Dowell***, S. Weiss, D. Hill, D. Infield, "Improved Spatial Modelling of Wind Fields," European Wind Energy Association Annual Conference, Vienna, 2013.

∗ denotes presenting author

Funding and Awards

NB: Projects labelled TIC-* refer to those funded by the University of Strathclyde's Technology and Innovation Centre's industry funded Low Carbon Power and Energy Programme.

Funding

EPSRC-UKRI Innovation Fellowship (PI & Research Fellow, 2018–2021, £310k), *"System-wide Probabilistic Energy Forecasting."*

EPSRC Supergen Wind Flexible Funding Special Projects Call (Co-I, 2018, £30k), *"Automated Video Analysis for Accurate Wave Height Measurements in Offshore Wind Farms."*

TIC-Hydro-01 (PI, 2017–2018, 6 months, £40k), *"Short to Medium Term Hydro Resource Forecasting"*

Energy Technology Partnership (PI, 2017–2018, 5 months, £20k), *"Dynamic Load Grid Modelling"*

The DataLab Industrial PhD Studentship, with Natural Power (PI, 2017–2021, £60k), *"Predictive Analytics for Short-term Wind and Solar Power Forecasting"*

Knowledge Transfer Partnership, Romax Insight (Co-I, 2017–2019, £240k), *"Advanced wind turbine prognostics using machine learning"*

TIC-Wind-03B (Co-I & Researcher, 2017–2018, £145k), *"Commercial Frequency Response from Wind."*

TIC-Wind-03, (Co-I & Researcher, 2016, £20k), *"Ancillary Services from Wind: Initial Survey of possible Technical and Economic Opportunities."*

EPSRC Doctoral Prize, (Prize Winner & Researcher, 2015–2017, £100k), *"Optimal Operation of Wind Power Plant Informed by Probabilistic Forecasts."*

Awards

Winner of the EEM 2017 Wind Power Forecasting Competition

Glasgow Research Partnership in Engineering (PI, 2017, £4k): "Probabilistic Solar Power Forecasting."

International Institute of Forecasters Travel Award Grant (2016, US$1k)

Glasgow Research Partnership in Engineering, (PI, 2016, £2k), "Production and Use of Probabilistic Wind Power Forecasts."

Finalist: Scottish Renewables Young Professionals Green Energy Awards, Academic Category, 2015.

Outstanding student paper award, PMAPS Conference, 2014.
For a paper titled "Spatio-temporal prediction of wind speed and direction by continuous directional regime."

COST Action ES1002 WIRE: Scientific Mission, Visit to DTU/Prof Pierre Pinson (PI, 2013, £2k), "Spatio-temporal Aspects of Probabilistic Wind Power Forecasting."

Research Supervision and Management

RA

Fulin Fan (2018, 5 months), *"Short to Medium Range Hydro Resource Forecasting"*
David Murray (PI, 2017–2018, 5 months), *"Dynamic Load Grid Modelling"*
Euan MacMahon (Co-I, 2017–2018, 4 months), *"Commercial Frequency Response from Wind."*
Marcel Nedd (Co-I, 2017–2018, 9 months), *"Commercial Frequency Response from Wind."*
David Hamilton, (Co-I, 2017, 2 months), Consultancy Project

PhD

Rosemary Tawn (First Supervisor, 2018–...), *"Predictive Analytics for Short-term Wind and Solar Power Forecasting,"* industry sponsored PhD with Natural Power and The DataLab.

Ciaran Gilbert (Co-supervisor, 2016–...), *"Topics in High Dimensional Energy Forecasting,"* Wind & Marine Energy CDT.

Alice Malvaldi (Mentor, 2014–...), *"Spatio-Temporal Prediction of Wind Based on Wind Velocity and Related Parameters,"* Wind Energy Systems CDT.

MSc Pablo Benavides López (Visiting Strathclyde from Technical University of Denmark, 2018), *"Probabilistic Electricity Price Forecasting."*

MRes Ahmed El-Bozie (Wind & Marine CDT, 2017), *"Probabilistic Forecasting of Maximum Wave Height."*

Patrick McGuckin (Future Power Networks CDT, 2017), *"Solar Power Forecasting and Operation of Combined Solar and Battery,"* with British Solar Renewables.

Sofia Koukoura (Wind & Marine CDT, 2016), *"Hierarchical Wind Power Forecasting."*

Ciaran Gilbert (Wind & Marine CDT, 2016), *"Price Forecasting for Participation in Electricity Markets,"* with RES Ltd.

Owain Roberts (Wind & Marine CDT, 2015), *"Evaluation of the benefits for a utility to improve wind power forecast skill for market participation,"* with EDF Energy.

Alice Malvaldi (Wind Energy Systems CDT, 2014), *"Wind Prediction Enhancement by Supplementing Measurements with Numerical Weather Prediction Now-Casts."*

Hamish Macdonald (Wind Energy Systems CDT, 2013), *"Wind Prediction Enhancement by Environmental Parameters."*

Presentations, Seminars and Conferences

(Not associated with conference publications.)

Invited

- *"Energy Forecasting — Perspective from Europe and Academia,"* IEEE Power & Energy Society General Meeting, Special Panel Session, Portland, OR, USA, 2018.
- *"Temporal Structure in Short-term Solar Power Forecasting,"* University of Lancaster, Lancaster, UK, 2018.
- *"Regime-switching Spatio-temporal Wind Forecasting using Atmospheric Modes,"* University of Oxford Mathematical Institute, Oxford, UK, 2017.
- *"Improved Very-short-term Wind Forecasting using Atmospheric Classification,"* National Oceanic and Atmospheric Administration, Boulder, CO, USA, 2017.
- *"Probabilistic Energy Forecasting and Applications,"* National Centre for Atmospheric Research, Boulder, CO, USA, 2017.
- *"Probabilistic Energy Forecasting and Applications,"* National Renewable Energy Laboratory, Golden, CO, USA, 2017.
- *"Short-term Wind Power Forecasting,"* National Grid Electricity Transmission, Wokingham, UK, 2017.
- *"Strategic Participation of Stochastic Generators in Single-price Balancing Markets,"* Electricity Markets and Analytics Group, Technical University of Denmark, Copenhagen, Denmark, 2016.
- *"An Introduction to Wind Power Forecasting,"* European Academy of Wind Energy, 10th PhD Seminar on Wind Energy in Europe, Orléans, France, 2014.
- *"Short-term probabilistic Wind Power Forecasting,"* European Energy Research Alliance, Smart Grid Joint Programme, Glasgow, 2014.

Pres.

- *"Probabilistic Energy Forecasting and Applications,"* Royal Statistical Society Conference, Glasgow, UK, September, 2017.
- *"Short-term O&M Risk Management when using Cranes,"* Wind Energy Science Conference, Copenhagen, Denmark, 26–29 June, 2017.
- *"Large-scale Very-short-term Spatio-temporal Forecasting by Spare Vector Autoregression,"* EWEA Wind Power Forecasting Technology Workshop, Leuven, Belgium, 1-2 October, 2015.
- *"Large-scale Very-short-term Spatio-temporal Forecasting by Spare Vector Autoregression,"* Wind Engineering Society Research Day, Reading, UK, 2015.
- *"Spatio-temporal Wind Forecasting,"* (poster), Durham Risk Day, Durham, UK, 2014.

Teaching Activity

2018 *EES-UETP: Statistical Learning for Uncertainty Forecasting*

2017–2018 *Data Science for Environmental Modelling and Renewables—MOOC*

2016–... *Tutor, EE107, Electrical Engineering; BSc & MEng*

2016–... *Guest Lecturer, Wind and Marine Energy Systems Centre for Doctoral Training*

2015–... *Guest Lecturer: EE577–977–988; MEng & MSc*

2012–... *Teaching Assistant: EE317, EE577–977–988; BSc, MEng & MSc*

2012–2015 *Educational Outreach: Glasgow Schools, Science Centre and Science Festival*

Professional Membership

IEEE Student Member 2015, Member 2016–present, inc. membership of the Power and Energy Society

CIGRE 'Next Generation Network' Member, 2017–present.

RSS Fellow of the Royal Statistical Society, 2017–present.

HEA Fellow of the Higher Education Academy, 2017–present.