Nicole Ludwig

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https://scholar.google.de/citations?user=by3EWqIAAAAJ&hl=en

Education

PhD in Computer Science — **Since 2016**
Karlsruhe Institute of Technology
Supervisor: Prof. Dr. Veit Hagenmeyer
Thesis: Flexibility in Complex Energy Systems

MSc in Information Systems and Network Economics with honours — **2014 - 2016**
University of Freiburg
Thesis: Machine Learning for Unstructured Data

Erasmus Exchange Semester — **2015**
University of Oslo, Department of Computer Science

BSc in Economics — **2011 - 2014**
University of Freiburg
Thesis: Predictive Analytics for Electricity Prices using Weather Data

Research Experience

Doctoral Researcher — **Since 2016**
Institute for Automation and Applied Informatics & DFG Research Training Group Energystatusdata, Karlsruhe Institute of Technology
Research on pattern recognition and flexibility detection in energy time series data, as well as agent based modelling of flexibility.

Research and Teaching Assistant — **2016**
Chair for Information Systems Research, University of Freiburg
Research on machine learning methods for unstructured text data (financial news).

Student Research and Teaching Assistant — **2014 – 2016**
Chair for Information Systems Research, University of Freiburg
Research on forecasting methods for energy time series, especially energy spot market prices.

Student Research and Teaching Assistant — **2012 – 2014**
Department of Applied Econometrics, University of Freiburg
Econometric analysis of the German labour market.

Teaching Experience

Exercise Session *Energy Informatics II*	Summer Term 2018
Exercise Session *Data Analysis for Engineers*	Summer Term 2018
Seminar *Optimising Energy in Smart Cities*	Summer Term 2017, Winter Term 2017
Seminar *Energy Informatics*	Winter Term 2016
Exercise Sessions *Optimization and Simulation*	Summer Term 2016
Computer Sessions *Advanced Programming in R*	Summer Term 2015
Tutorials *Econometrics*	Winter Term 2014
Tutorials *Microeconomics II (Game Theory)*	Summer Term 2013

Tutorials *Mathematics for Economists* Winter Term 2012, 2013

Supervised Theses:

Developing a Forecasting Tool for Industrial Energy Time Series (Master Computer Science)
Data Analytics: What's the Influence of Preprocessing? (Master Engineering)
The Impact of Preprocessing on Energy Time Series Analysis (Bachelor Eng)
Expert Knowledge for Unsupervised Machine Learning in Energy Time Series (Master CS)
Agent-based Simulation of Flexibility in Industrial Energy Systems (Master Eng)
Finding Patterns in Time Series - A Comparison of Unsupervised Learning Methods (Bachelor CS)
Assessing the Value of Smart Meter Data (Bachelor CS)

Language Skills

German	Native Language
English	Fluent writing and speaking skills (TOEFL-Score: 113/120, CEFR: C2)
Norwegian (Bokmål)	Advanced skills (CEFR: B2)
French	Advanced skills (CEFR: B1)
Chinese	Basic Skills (HSK 1)

Awards

Best Paper Award	Energy Informatics Conference 2017, Lugano
Audience Choice Award: Best Paper	ACM e-Energy 2018, Karlsruhe

List of Publications

Ludwig, Nicole; Mikut, Ralf; Hagenmeyer, Veit (2018): Auction Design to use Flexibility Potentials in the Energy-Intensive Industry. In: 15th International Conference on the European Energy Market (EEM). Lodz, Poland. (in Press)

Barth, Lukas; Hagenmeyer, Veit; Ludwig, Nicole; Wagner, Dorothea (2018): How much demand side flexibility do we need? Analyzing where to exploit flexibility in industrial processes. In: Proceedings of the Ninth International Conference on Future Energy Systems - e-Energy '18. the Ninth International Conference. Karlsruhe, Germany. New York, New York, USA: ACM Press, S. 43–62.

Staudt, Philipp; Ludwig, Nicole; Huber, Julian; Hagenmeyer, Veit; Weinhardt, Christof (2018): SCiBER: A new public data set of municipal building consumption. In: Proceedings of the Ninth International Conference on Future Energy Systems - e-Energy '18. the Ninth International Conference. Karlsruhe, Germany. New York, New York, USA: ACM Press.

Ludwig, Nicole; Waczowicz, Simon; Mikut, Ralf; Hagenmeyer, Veit (2018): Assessment of Unsupervised Standard Pattern Recognition Methods for Industrial Energy Time Series. In: Proceedings of the Ninth International Conference on Future Energy Systems - e-Energy '18. the Ninth International Conference. Karlsruhe, Germany. New York, New York, USA: ACM Press, S. 434–435.

Waczowicz, Simon; Ludwig, Nicole; Ordiano, Jorge Á. G.; Mikut, Ralf; Hagenmeyer, Veit (2018): Demand Response clustering: Automatically finding optimal cluster hyper-parameter values. In: Proceedings of the Ninth International Conference on Future Energy Systems - e-Energy '18. The Ninth International Conference. Karlsruhe, Germany. New York, New York, USA: ACM Press, S. 429–430.

González Ordiano, Jorge Ángel; Bartschat, Andreas; Ludwig, Nicole; Braun, Eric; Waczowicz, Simon; Renkamp, Nicolas et al. (2018): Concept and benchmark results for Big Data energy forecasting based on Apache Spark. In: Journal of Big Data 5 (1), S. 11.

Barth, Lukas; Ludwig, Nicole; Mengelkamp, Esther; Staudt, Philipp (2018): A comprehensive modelling framework for demand side flexibility in smart grids. In Comput Sci Res Dev 33 (13), pp. 1865–2042.

Ludwig, Nicole; Waczowicz, Simon; Mikut, Ralf; Hagenmeyer, Veit (2017): Mining Flexibility Patterns in Energy Time Series from Industrial Processes. In Frank Hoffmann, E. Hüllermeier, Ralf Mikut (Eds.): Proceedings. 27. Workshop Computational Intelligence, Dortmund, 23. - 24. November 2017. Karlsruhe: KIT Scientific Publishing, pp. 13–32.

Jakob, W.; Ordiano, J. Á. González; Ludwig, N.; Mikut, R.; Hagenmeyer, V. (2017): Towards coding strategies for forecasting-based scheduling in smart grids and the energy lab 2.0. In Unknown (Ed.): Proceedings of the Genetic and Evolutionary Computation Conference Companion on - GECCO '17. the Genetic and Evolutionary Computation Conference Companion. Berlin, Germany. New York, New York, USA: ACM Press, pp. 1271–1278.

Ludwig, Nicole; Feuerriegel, Stefan; Neumann, Dirk (2015): Putting Big Data analytics to work. Feature selection for forecasting electricity prices using the LASSO and random forests. In Journal of Decision Systems 24 (1), pp. 19–36.

Ludwig, Nicole; Feuerriegel, Stefan; Neumann, Dirk (2016): Time Series Analysis for Big Data: Evaluating Bayesian Structural Time Series Using Electricity Prices. In Volker Nissen, Dirk Stelzer, Steffen Straßburger, Daniel Fischer (Eds.): Multikonferenz Wirtschaftsinformatik (MKWI) 2016. Technische Universität Ilmenau, 09. - 11. März 2016, III. Ilmenau: Universitätsverlag Ilmenau, pp. 1569–1580.