ALINA **WALCH**

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Early-career scientist developing interdisciplinary research that combines data science and energy engineering. Passionate about motivating young people to start an engineering career.

EDUCATION

PhD Student | École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
08/2017 – 07/2021 (expected)
- Research on the application of Machine Learning for renewable energy generation at regional scale, with particular focus on solar and geothermal energy
- Development of data-driven methods to analyse and model large environmental datasets
- Funded by the Swiss National Research Program on Big Data (NRP75)

Master of Electrical Engineering with Management | Imperial College London
09/2013 – 06/2017
- Graduated with first class honours (83.2%) – ranked 1st in the class
- Master thesis on Personalisation of Autonomous Vehicle driving using Machine Learning
- Technical focus on Energy Systems, Machine Learning and Signal Processing

Abitur (grade 1.0) | Nymphenburger Gymnasium, Munich, Germany (2012)

EXPERIENCE

Engineering Intern | BMW Group, Munich, Germany
04/2016 – 09/2016
- Development and assessment of optimization algorithms for intelligent charging of electric vehicle fleets using Matlab; Implementation in C and Java for testing on BMW i3 vehicles
- Critical analysis of policies for promoting electric mobility in Germany and worldwide

Risk Management Intern | Nokia Networks and Solutions, Munich, Germany
08/2014 – 09/2014
- Project planning and execution of a company-wide risk assessment analysis
- Working in a consulting team to formulate best practices in supply chain management

SKILLS

- Proficient programming skills in Python, Matlab, C++, LaTeX
- Experience in using Machine Learning toolkits (e.g. Scikit-learn, TensorFlow)
- Adept at parallelisation for high-performance computing
- Languages: German (native), English (C2), Spanish (C1), French (B2)

AWARDS

- *Lee Memorial Prize 2017* (awarded to one graduating student) and *BP Dean's Award 2015* for excellence in academic and extra-curricular activities
- *Dean's List 2014, 2015, 2016, 2017* awarded to the top 10% of students
- *ACC Colours 2016* and *2017* for outstanding commitment to university sport and society

ACTIVITIES

2018: Participant in Hack'n'Lead and Energy Blockchain Hackathon (Smart Home application)
2016-2017: Co-founder and chair of Imperial College Women in Electrical Engineering Society
2014-2017: Women's captain and president of Imperial College Basketball Club
2012-2013: Year abroad in South America and voluntary work at Hogar de Christo, Chile

PUBLICATIONS

Journal papers

Walch, Alina, Roberto Castello, Nahid Mohajeri, and Jean-Louis Scartezzini. 'Big Data Mining for the Estimation of Hourly Rooftop Photovoltaic Potential and Its Uncertainty'. Applied Energy 262 (15 March 2020): 114404. https://doi.org/10.1016/j.apenergy.2019.114404.

Walch, Alina, Nahid Mohajeri, Agust Gudmundsson, and Jean-Louis Scartezzini. 'Quantifying the Technical Geothermal Potential from Shallow Borehole Heat Exchangers at Regional Scale'. Renewable Energy 165 (1 March 2021): 369–80. https://doi.org/10.1016/j.renene.2020.11.019.

Walch, Alina, Xiang Li, Jonathan Chambers, Nahid Mohajeri, Selin Yilmaz, Martin Patel, and Jean-Louis Scartetzzini. 'Shallow Geothermal Energy Potential for Heating and Cooling of Buildings with Regeneration under Climate Change Scenarios'. Submitted to Energy (December 2020).

Conference proceedings, abstracts, posters

Walch, Alina, Roberto Castello, Nahid Mohajeri, Fabian Guignard, Mikhail Kanevski, and Jean-Louis Scartezzini. 'Spatio-Temporal Modelling and Uncertainty Estimation of Hourly Global Solar Irradiance Using Extreme Learning Machines'. Energy Procedia, Innovative Solutions for Energy Transitions, 158 (1 February 2019): 6378–83. https://doi.org/10.1016/j.egypro.2019.01.219.

Walch, Alina, Roberto Castello, Nahid Mohajeri, and Jean-Louis Scartezzini. 'A Big Data Approach to Estimate Available Roof Area for Solar PV Installation at National Scale', 21:10640, 2019. https://meetingorganizer.copernicus.org/EGU2019/EGU2019-10640.pdf.

Walch, Alina, Nahid Mohajeri, and Jean-Louis Scartezzini. 'A Critical Comparison of Methods to Estimate Solar Rooftop Photovoltaic Potential in Switzerland'. Journal of Physics: Conference Series 1343 (November 2019): 012035. https://doi.org/10.1088/1742-6596/1343/1/012035.

Walch, Alina, Roberto Castello, Nahid Mohajeri, and Jean-Louis Scartezzini. 'A Fast Machine Learning Model for Large-Scale Estimation of Annual Solar Irradiation on Rooftops'. ISES SWC2019 / SHC2019 Conference Proceedings, 2019, 10. https://doi.org/10.18086/swc.2019.45.12.