MAXIMILIAN PIERZYNA

Rotterdam, The Netherlands
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Passionate about solving physical problems with data-driven methods.
Currently developing machine learning models of atmospheric turbulence.

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EDUCATION

Delft University of Technology   2022-08 – ongoing
PhD Student, expected graduation 2026-08   Delft, The Netherlands

Technical University of Braunschweig   2019-10 – 2022-07
Aerospace Engineering, Master of Science (with honours)   Braunschweig, Germany

KTH Royal Institute of Technology   2020-08 – 2021-01
Aerospace Engineering, Erasmus+ Exchange   Stockholm, Sweden

Technical University of Braunschweig   2015-10 – 2019-09
Mechanical Engineering, Bachelor of Science   Braunschweig, Germany

PUBLICATIONS

[5]   M. Pierzyna, S. Basu, and R. Saathof, "OTCliM: Generating a near-surface climatology of optical turbulence strength (C_n^2) using gradient boosting," *Artificial Intelligence for the Earth Systems*, 2025, accepted. Preprint: 10.48550/arXiv.2408.00520.

[4]   M. Pierzyna, O. Hartogensis, S. Basu, and R. Saathof, "Intercomparison of flux, gradient, and variance-based optical turbulence (C_n^2) parameterizations," *Applied Optics*, vol. 63, no. 16, Jun. 2024. DOI: 10.1364/AO.519942.

[3]   M. Pierzyna, R. Saathof, and S. Basu, "Π-ML: A dimensional analysis-based machine learning parameterization of optical turbulence in the atmospheric surface layer," *Optics Letters*, vol. 48, no. 17, Sep. 2023. DOI: 10.1364/OL.492652.

[2]   M. Pierzyna, R. Saathof, and S. Basu, "A multi-physics ensemble modeling framework for reliable C_n^2 estimation," in *Proceedings of Environmental Effects on Light Propagation and Adaptive Systems VI*, vol. 12731, SPIE, Oct. 19, 2023, pp. 185–191. DOI: 10.1117/12.2680997.

[1]   M. Pierzyna, D. A. Burzynski, S. E. Bansmer, and R. Semaan, "Data-driven splashing threshold model for drop impact on dry smooth surfaces," *Physics of Fluids*, vol. 33, no. 12, Dec. 2021. DOI: 10.1063/5.0076427.

AWARDS AND HONOURS

Best Student Paper Award   2024-07
Optica Imaging Congress 2024

Highlighting of Pierzyna *et al.* [3] as "Editors' pick"   2023-09
Optica Publishing Group

Best Student Paper Award   2023-09
SPIE Remote Sensing 2023 – Environmental Effects on Light Propagation and Adaptive Systems

MACHINE LEARNING COMPETITIONS

Kelp Wanted: Segmenting Kelp Forests   2024-02
Finished #38/671; resulting *KelpNet* presented at ESA/ECMWF ML4EOPS as poster   DrivenData

RESEARCH VISITS

University at Albany
Visiting Scientist
2024-09 – 2024-11
Albany, NY, USA

Fraunhofer Institute of Optronics, System Technologies, and Image Exploitation (IOSB)
Visiting Scientist
2024-01-10 –12
Ettlingen, Germany

National Center of Atmospheric Research (NCAR)
Participant, NCAR Advance Study Program, Summer Colloquium 2023
2023-07-17 – 28
Boulder, CO, USA

PRESENTATIONS AND CONFERENCES

- **Airforce Institute of Technology**, Dayton, OH, USA (virtual talk) — 2024-08
  Generating a near-surface climatology of optical turbulence strength (C_n^2) using gradient boosting

- **Optica Imaging Congress 2024**, Toulouse, France (talk) — 2024-07
  Generating a near-surface climatology of optical turbulence strength (C_n^2) using gradient boosting

- **ESA/ECMWF ML4EOPS**, Frascati, Italy (poster) — 2024-05
  (Machine Learning for Earth System Observation and Prediction)
  KelpNet: Probabilistic Multi-Task Learning for Satellite-Based Kelp Forest Monitoring

- **Dutch Meteorological Society, Annual Meeting**, Utrecht, The Netherlands (talk) — 2023-11
  Π-ML: A Dimensional Analysis-Based Machine Learning Parameterization of Optical Turbulence in the Atmospheric Surface Layer

- **TMT International Observatory**, Pasadena, CA, USA (virtual talk) — 2023-09
  Π-ML: A Dimensional Analysis-Based Machine Learning Parameterization of Optical Turbulence in the Atmospheric Surface Layer

- **SPIE Remote Sensing 2023**, Amsterdam, The Netherlands (talk) — 2023-09
  A multi-physics ensemble modeling framework for reliable C_n^2 estimation

- **COAT 2023**, Durham, UK (talk) — 2023-03
  (Communications and Observations through Atmospheric Turbulence)
  Parametrizing optical turbulence (C_n^2) in the atmospheric surface layer with gradient boosting

REVIEWING ACTIVITIES

Quarterly Journal of the Royal Meteorological Society, Journal of the European Meteorological Society

VOLUNTARY WORK

Erasmus Student Network Germany
Multiple managing positions, currently, International Coordinator
2021-03 – ongoing
Germany

L.G. Snellius (study association)
Board member
2023-04 – 2024-03
Delft, The Netherlands

OTHER QUALIFICATIONS

- Language skills: German (native), English (proficient, CEFR C2), Dutch (independent, CEFR B2)

- IT skills: Linux administration, networking, Python, PyTorch, Keras, Tensorflow, jax, git, LaTeX, handling large datasets (version controlled)

- Weather Research and Forecasting (WRF) modeling on HPC