



resident Untere Hauptstrasse 100,  
7100 Neusiedl am See, Austria

born Aug 20, 1992 in Vienna

mail [daniel.haider@oeaw.ac.at](mailto:daniel.haider@oeaw.ac.at)

tel +43 6502834060

url <https://danedane-haider.github.io>

## Education

since 2020	University of Vienna	__ <i>PhD Mathematics</i>
2019	University of Vienna	__ <i>Master Mathematics</i>
2018	Universidade de Coimbra	__ <i>ERASMUS exchange</i>
2016	University of Vienna	__ <i>Bachelor Mathematics</i>

## Work experience

since 2020	Acoustics Research Institute, Vienna	__ <i>PhD student (P. Balazs)</i>
2023	LS2N, Nantes	__ <i>research stay (V. Lostanlen)</i>
2021/22	University of Vienna	__ <i>project co-worker (M. Ehler)</i>
2018/19	Acoustics Research Institute, Vienna	__ <i>Master student (P. Balazs)</i>
2017	Acoustics Research Institute, Vienna	__ <i>intern</i>
2017	Rotary project, Ghana	__ <i>school project Kwamekrom</i>

## Projects

2023 StruMoDeep: DOC fellowship, Austrian Academy of Sciences (A 26355)

## Talks and Posters

2023 - 40<sup>th</sup> International Conference on Machine Learning (ICML), Honolulu (Jul 23-29) \_\_ *poster*  
 - Mathematical Signal and Image Analysis, Burghausen (Mar 20-22) \_\_ *talk*  
 - Signal Image and Sound (Seminar), Nantes (Mar 16) \_\_ *talk*  
 - Frame Theory (Seminar), Vienna (Nov 24) \_\_ *talk*

2022 - Bi-annual Symposium on Harmonic Analysis, Strobl (Jun 20-24) \_\_ *poster*  
 - Harmonic Analysis (Seminar), Vienna (May 9) \_\_ *talk*  
 - Kymatio Workshop, Nantes (May 19-20) \_\_ *talk*  
 - 48<sup>th</sup> Annual Symposium on Acoustics (DAGA), Stuttgart (Mar 21-24) \_\_ *invited tutorial talk*

2021 - 2<sup>nd</sup> OEAW AI Summer school, Vienna (Sept 13-17) \_\_ *speaker, tutor*  
 - 29<sup>th</sup> European Signal Processing Conference (EUSIPCO-virtual), Dublin (Aug 23-27) \_\_ *talk*  
 - 47<sup>th</sup> Annual Symposium on Acoustics (DAGA), Vienna (Aug 15-18) \_\_ *invited tutorial talk*

2019 - 14<sup>th</sup> International Symposium on Computer Music Multidisciplinary Research (CMMR), Marseille (Oct 14-18) \_\_ *poster*

## Other participations

---

- 2023 3<sup>rd</sup> OEAW AI Winter school, Vienna (Jan 16-20) \_\_ *participant*
- 2022 25<sup>th</sup> Int. Conference on Digital Audio Effects, Vienna (Sept 6-10) \_\_ *co-organizer, participant*
- 2022 Workshop Science Communication (Kinderuni), Vienna (Feb 16) \_\_ *participant*
- 2021 2<sup>nd</sup> OEAW AI Summer school, Vienna (Sept 13-17) \_\_ *co-organizer, speaker*
- 2019 20<sup>th</sup> Annual Conference of the Int. Speech Communication Association (INTERSPEECH), Graz (Sept 15-19) \_\_ *student helper, participant*
- 2019 1<sup>st</sup> OEAW AI Summer school, Styria (Aug 5-9) \_\_ *participant*

## Publications

---

2024

- Daniel Haider, Martin Ehler, and Peter Balazs. **Injectivity of ReLU-layers: A frame theoretic discussion** \_\_ *to be submitted to Journal of Mathematics for Data Science (SIAM)*.
- Daniel Haider, Vincent Lostanlen, Peter Balazs, and Martin Ehler. **Instabilities in convnets for raw audio**. *IEEE Signal Processing Letters*, Vol. 31, pp. 1084-1088, 2024.

2023

- Vincent Lostanlen, Daniel Haider, Han Han, Mathieu Lagrange, Martin Ehler, and Peter Balazs. **Fitting auditory filterbanks with multiresolution neural networks**. In Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), New Paltz, New York, 2023.
- Daniel Haider, Martin Ehler, and Peter Balazs. **Convex geometry of ReLU-layers, injectivity on the ball and local reconstruction**. In Proceedings of the International Conference of Machine Learning (ICML), Honolulu, Hawaii, 2023.
- Hans G. Feichtinger, Peter Balazs, and Daniel Haider. **Double preconditioning for Gabor frame operators: Algebraic, functional analytic and numerical aspects**. *Applied and Computational Harmonic Analysis*, pp. 1-50, 2023.

2021

- Daniel Haider, Peter Balazs, and Nicki Holighaus. **Phase-based signal representation for scattering**. Proceedings of the 29th European signal processing conference (EUSIPCO), Dublin, Ireland, 2021, pp. 6-10.
- Daniel Haider, Peter Balazs, Nicki Holighaus, and Lorenz Gutscher. **Zeit-Frequenz Darstellungen und Deep Learning**. Proceedings of the 47<sup>th</sup> annual symposium on acoustics (DAGA), Vienna, Austria, 2021, pp. 29-32.

2019

- Daniel Haider and Peter Balazs. **Extraction of rhythmical features with Gabor scattering**. Proceedings of the 14th international symposium on computer music multidisciplinary research (CMMR), Marseille, France, 2019, pp. 916-923.

## IT skills

---

- Python \_\_ *development of machine learning algorithms and deep learning models for audio (Pytorch)*
- MATLAB \_\_ *advanced time-frequency transforms for the Large Time-frequency Analysis Toolbox (LTFAT)*
- GitHub \_\_ *research collaborations and publication of code that accompanies research papers*
- Logic X \_\_ *production and performance of original music*
- Adobe (Premiere, Illustrator, Photoshop) \_\_ *video production and graphic design*