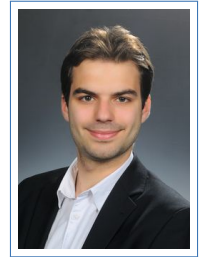


# Mones Raslan

## Curriculum Vitae

Technische Universität Berlin  
Department of Mathematics  
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### Personal Data

Date of Birth February 9, 1993  
Place of Birth Leipzig, Germany  
Nationality German

### Educational Background

#### School

Sep 04 – Jun 11 **Werner-von-Siemens-Gymnasium**, Berlin.  
Jun 11 **Abitur**, Final grade: 1.0.

#### Academic

Oct 11 – Mar 17 **Studies in Mathematics**, *Technische Universität Berlin*.  
Apr 15 **Bachelor's Degree in Mathematics**, *Technische Universität Berlin*, Final grade: 1.3.  
Mar 17 **Master's Degree in Mathematics**, *Technische Universität Berlin*, Final grade: 1.0.  
Oct 16 – Mar 17 **BMS-Student Phase I**, *Berlin Mathematical School*.  
Oct 17 – **BMS-Student Phase II**, *Berlin Mathematical School*.

### Working Experience

Oct 13 – Mar 17 **Student Teaching Assistant**, *Technische Universität Berlin*, Department of Mathematics.  
Oct 15 – Mar 17 **Student Research Assistant**, *Technische Universität Berlin*, Department of Mathematics, Research Group Applied Functional Analysis.  
since Apr 17 **Research Assistant**, *Technische Universität Berlin*, Department of Mathematics, Research Group Applied Functional Analysis.

### Journal Publications

**A Theoretical Analysis of Deep Neural Networks and Parametric PDEs**, joint work with G. Kutyniok, P. Petersen and R. Schneider, accepted for publication in *Constructive Approximation*, 2020.

**Topological Properties of the Set of Functions Generated by Neural Networks of Fixed Size**, joint work with P. Petersen and F. Voigtlaender, *Foundations of Computational Mathematics*, <https://doi.org/10.1007/s10208-020-09461-0>, 2020.

**Anisotropic Multiscale Systems on Bounded Domains**, joint work with P. Grohs, G. Kutyniok, J. Ma, and P. Petersen, *Advances in Computational Mathematics*, 46, 39, 2020.

**Approximation properties of hybrid shearlet-wavelet frames for Sobolev spaces**, joint work with P. Petersen, *Advances in Computational Mathematics*, 45(3):1581-1606, 2019.

### Preprints

**Expressivity of Deep Neural Networks**, joint work with I. Gühring and G. Kutyniok, to appear as a book chapter in "Theory of Deep Learning", Cambridge University Press, arXiv:2007.04759, 2020.

**Approximation Rates for Neural Networks with Encodable Weights in Smoothness Spaces**, joint work with I. Gühring, arXiv:2006.16822, 2020.

**Numerical Solution of the Parametric Diffusion Equation by Deep Neural Networks**, joint work with P. Petersen, R. Schneider and G. Kutyniok, arXiv:2004.12131, 2020.

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## Conference Proceedings

**The structure of spaces of neural network functions**, joint work with P. Petersen and F. Voigtländer, Proceedings SPIE 11138, Wavelets and Sparsity XVIII, 111380F, San Diego, 2019.

**Unfavorable structural properties of the set of neural networks with fixed architecture**, joint work with P. Petersen and F. Voigtländer, Proceedings of International Conference on Sampling Theory and Applications (SampTA), IEEE, Bordeaux, 2019.

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## Honors and Awards

Oct 10 **Pupil's Award**, *Physikalische Gesellschaft zu Berlin*.

Jun 11 **Book Award**, *Deutsche Physikalische Gesellschaft*.

Nov 15 **Deutschlandstipendium**.

Nov 15 **Bachelorpreis**, *Berliner Mathematische Gesellschaft*.

Nov 15 **3rd Place in the Category "Best Bachelor Degree"**, *Dies mathematicus, Technische Universität Berlin*.

Oct 16 **Admission into the Berlin Mathematical School**.

Dec 17 **"Best Talk"**, *Dies mathematicus, Technische Universität Berlin*.

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## Conferences and Scientific Talks

Jun 16 **Time-Frequency Analysis and Related Topics**, *Strobl, Austria*.  
Poster on "Shearlet Frames for Sobolev Spaces"

Jul 17 **Reliable Methods of Mathematical Modeling**, *Berlin, Germany*.  
Invited Talk on "Adaptive Solution of Elliptic PDEs using Boundary Adapted Shearlets"

Feb 18 **Rhein-Ruhr-Workshop**, *Bestwig, Germany*.  
Talk on "Construction and Approximation Properties of Shearlet Frames for Sobolev Spaces"

Jul 19 **Signal Processing with Adaptive Sparse Structured Representations (SPARS)**, *Toulouse, France*.  
Poster on "Efficient Approximation of Solutions of Parametric PDEs by ReLU Neural Networks"

Jul 19 **Sampling Theory and Applications (SampTA)**, *Bordeaux, France*.  
Talk on "Unfavorable structural properties of the set of neural networks with fixed architecture"

Aug 19 **Waves 2019**, *Vienna, Austria*.  
Invited Talk on "Adaptive solution of PDEs using hybrid shearlet-wavelet frames"

Sep 19 **Joint BBDC/BZML Workshop**, *Berlin, Germany*.  
Poster on "Solving parametric PDEs by neural networks"

Mar 20 **SIAM Conference on Uncertainty Quantification**, *Munich, Germany*.  
Invited Talk on "Solving Parametric PDEs with Deep Neural Networks: A Theoretical and Numerical Analysis" (Cancelled due to Covid-19)

Nov 20 **Deep Math Conference on the Mathematical Theory of Deep Neural Networks**, *New York, USA*.  
Poster on "Complexity Bounds for Neural Networks with Encodable Weights in Smoothness Spaces"

Mar 21 **SIAM Conference on Computational Science and Engineering**, *Fort Worth, USA*.  
Invited Talk on "Solving the Parametric Diffusion Equation by Deep Neural Networks: A Comprehensive Numerical Study"

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## Reviewing Work for the Following Journals

**Neural Networks.**

**Constructive Approximation.**

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## Teaching Experience

- Winter 13/14 **Tutor for “Linear Algebra for Engineers”**, *Technische Universität Berlin.*  
Summer 14 **Tutor for “Linear Algebra for Engineers”**, *Technische Universität Berlin.*  
Winter 14/15 **Tutor for “Analysis I for Engineers”**, *Technische Universität Berlin.*  
Summer 15 **Tutor for “Linear Algebra for Engineers”**, *Technische Universität Berlin.*  
Winter 15/16 **Tutor for “Linear Algebra for Engineers”**, *Technische Universität Berlin.*  
Summer 16 **Tutor for “Analysis I for Mathematicians”**, *Technische Universität Berlin.*  
Winter 16/17 **Tutor for “Differential Equations for Engineers”**, *Technische Universität Berlin.*  
Summer 17 **Teaching Assistant for “Functional Analysis I”**, *Technische Universität Berlin.*  
Winter 17/18 **Teaching Assistant for “Functional Analysis II” and “Deep Learning”**, *Technische Universität Berlin.*  
Summer 18 **Teaching Assistant for “Functional Analysis III”**, *Technische Universität Berlin.*  
Winter 18/19 **Teaching Assistant for “Functional Analysis II”**, *Technische Universität Berlin.*  
Summer 19 **Teaching Assistant for “Functional Analysis I”**, *Technische Universität Berlin.*  
Winter 19/20 **Tutor for “Analysis I for Engineers”**, *Technische Universität Berlin.*  
Summer 20 **Teaching Assistant for “Analysis I and Linear Algebra for Engineers”**, *Technische Universität Berlin.*  
Winter 20/21 **Teaching Assistant for “Analysis I and Linear Algebra for Engineers”**, *Technische Universität Berlin.*

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## Monographs

**Construction and Analysis of Shearlet Frames for Sobolev Spaces**, *Master Thesis, Technische Universität Berlin, 2017.*

**Ridgelets and Linear Transport Equations**, *Bachelor Thesis, Technische Universität Berlin, 2015.*

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## Membership in Mathematical Societies

**Berliner Mathematische Gesellschaft**, BMG.

**Berlin Mathematical School**, BMS.

**Deutsche Mathematiker-Vereinigung**, DMV.

Berlin, October 5, 2020