

DAEDALUS Newsletter

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DAEDALUS

RTG 2433

DAEDALUS personnel

Since the last newsletter our research training group has grown. End of February 2019 Oleksandr Zlatov started as PhD student in the group of Prof. Dr. Benjamin Blankertz. He is working on Project 05. With the entry of Mariia Seleznova in October 2019 in the group of Prof. Dr. Gitta Kutyniok all PhD student positions are filled. Mariia is working on Project 08. Further, we welcome Mathias Oster and Raquel Mäusle as associated members. Mathias Oster is working in the group of Prof. Dr. Reinhold Schneider, Raquel Mäusle works in the group of Prof. Dr. Wolf-Christian Müller.

We are still seeking associated DAEDALUS members! Associated members are full members who can participate in all DAEDALUS activities, among other soft skill courses, winter/autumn schools, PhD students' seminars. To apply the following documents should be submitted to office[at]daedalus.tu-berlin.de: Letter of motivation, CV, certificates and letter of recommendation.

DAEDALUS website

Our new website (www.daedalus.berlin) was launched in August 2019 publishing all relevant information on DAEDALUS, its members as well as events, news and publications. In order to keep it up to date, please send us information on your recent publications, conference contributions or other news and achievements you may want to publish on the website.

DAEDALUS retreat 2019

Our first DAEDALUS research retreat took place from May 02-03, 2019 in Berlin at DAS SCHMÖCK-WITZ. The PhD students presented in a 15 minutes talk an outline of their projects and their progress during the first few months of their PhDs. The talks were attended by the DAEDALUS PIs. Afterwards, each supervisory committee met separately to give feedback and discuss the projects in detail. Further in the program, each student presented a high impact paper to the group.

DAEDALUS winter school 2019

Our first DAEDALUS Winter School took place from December 02-06, 2019 nearby Berlin at the Seehotel Zeuthen. Nine invited speakers gave compelling lectures on the subject of 'Machine Learn-

ing meets Numerical Analysis of PDEs' (see list below). Further to the DAEDALUS students, participants from Deutsches Elektronen-Synchrotron DESY (Zeuthen), SISSA – Scuola Internazionale Superiore di Studi Avanzati (Trieste, Italy) and ETH Zurich attended the school. Between classes and during the poster session, students, lecturers and DAEDALUS staff had the possibility to discuss the topics and/or aspects of their work further.

Some impressions of the winter school.



Speakers:

- Prof. Dr. Markus Bachmayr (Johannes Gutenberg-Universität Mainz): 'Adaptive sparse and Low-Rank Approximations for High-Dimensional Problems'
- Prof. Dr. Arnulf Jentzen (University of Münster): 'A Mathematical Introduction to Deep Learning'
- Prof. Dr. Gitta Kutyniok (Technische Universität Berlin): 'Beating the Curse of Dimensionality: A Theoretical Analysis of Deep Neural Networks and Parametric PDEs'
- Prof. Dr. Nathan Kutz (University of Washington): 'Data-driven discovery of governing equations and laws in engineering, physics and biology'
- Prof. Dr. Ivan Oseledets (Skoltech Faculty Moscow): 'Constructive methods for multivariate function approximations using tensors and deep learning'
- Prof. Dr. Philipp Petersen (University of Vienna): 'A primer on approximation theory of neural networks'
- Leon Sallandt (Technische Universität Berlin): 'A simple implementation of the policy iteration for solving the HJB equation'
- Prof. Dr. Tobias Schaeffter (Physikalisch-Technische Bundesanstalt Berlin): 'Quantitative Magnetic Resonance Imaging'
- Prof. Dr. Reinhold Schneider (Technische Universität Berlin): 'Hamilton Jacobi Bellman Equation and Feedback Control of Partial Differential Equations'

DAEDALUS international guests 2019

Last year we welcomed several international guests at our RTG.

Prof. Dr. Christopher Beattie (Virginia Tech) visited the group of Prof. Dr. Mehrmann in May and June 2019. Prof. Beattie gave an exciting talk on 'Data-driven identification of dissipative dynamics'. Further, he met several members of our RTG for discussions.

In October 2019 Prof. Dr. Matthew Juniper (Trinity College, Cambridge) was a guest in the group of Prof. Dr. Sesterhenn. Further, to some fruitful discussions he gave a compelling one-day tutorial on 'Instability Methods in Hydrodynamics' to our PhD students.

Dr. Marco Congedo (Université de Grenoble Alpes) visited the group of Prof. Dr. Benjamin Blankertz in November 2019. Dr. Congedo gave a fascinating talk with the title 'A Tutorial on Riemannian geometry for Brain-Computer Interface classification'.

Further in November 2019 our RTG welcomed Dr. Özgür Gürçan (CEDEX, France). He was guest in the group of Prof. Dr. Wolf-Christian Müller and gave an exciting talk on 'Turbulence in Fusion Plasmas'.

In December 2019 we received Dr. Alexander von Lühmann (Boston University), who gave an insight on his recent work 'Towards Brain Imaging in the Everyday World – recent progress and my personal journey'. The talk was followed by a round table where our PhD students could ask questions regarding his work, personal experience, etc..

Shortly before christmas the group of Prof. Dr. Schneider welcomed Prof. Dr. Roland Duduchava (University of Georgia and Ivane Javakhishvili Tbilisi State University), who gave a talk on 'Solvability of the shell equation derived by the Γ -convergence'.

Future Events

March 31, 2020	Due date for submission of the DAEDALUS progress report of the PhD students
April 20-21, 2020	DAEDALUS research retreat at DAS SCHMÖCKWITZ
October 05-09, 2020	DAEDALUS Autumn School

Further information and events will follow. Please also consult our website for details.

Thank you all for your contributions!