Sahir N. Butt
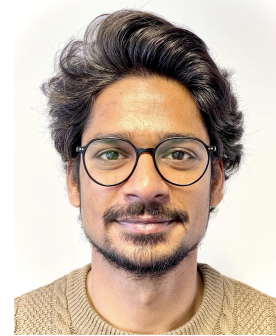
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Personal Information

Date of birth	26.10.1991
Nationality	German

Education

Dr.-Ing.	Computational Engineering Ruhr-Universität Bochum, Germany *(with distinction)*	2017 - 2023
M.Sc.	Computational Engineering Ruhr-Universität Bochum, Germany *(with distinction)*	2014 - 2017
B.E.	Automotive Engineering NED University, Karachi, Pakistan *(with distinction)*	2010 - 2014

Professional Experience

Research Associate	High Performance Computing, Ruhr-Universität Bochum	since 2023
Research Associate	Institute for Structural Mechanics, Ruhr-Universität Bochum	2017 - 2023
Deputy Science Manager	Research Department: Subsurface Modeling and Engineering, Ruhr-Universität Bochum	2018 - 2021
Research Assistant	Institute for Structural Mechanics, Ruhr-Universität Bochum	2015 - 2017

Awards

2021	Elected as GAMM Junior for the years 2021-2023
2020	Best poster, *USACM Workshop on Experimental and Computational Fracture Mechanics 2020, Louisiana, USA.*
2020	Travel grant, Oak Ridge National Laboratory, *USACM Workshop on Experimental and Computational Fracture Mechanics 2020, Louisiana, USA.*
2019	Best student paper, *ETS Tunneling and Underground Construction Conference 2019, Egypt.*
2019	Best paper, *TBM DiGs conference 2019, Colorado, USA.*

2017   Book prize 2017, *Computational Engineering Faculty prize for excellent academic performance, Ruhr-University Bochum, Germany.*

2016   First Fast-Track scholarship, *Collaborative Research Center 837 "Interaction Modeling in Mechanized Tunneling" (SFB 837).*

Teaching

since 2017   Finite Element Methods in Linear Computational Dynamics
2020 - 2021   Finite Element Methods in Linear Structural Mechanics
2019 - 2020   Applied Finite Element Methods
Supervision of 2 internal and 5 external Master theses (Bosch, Autoliv, Hella, Forvia, CE-N gmbh)

Projects and Grants

CHBU28   Computing time at Gauss Centre for Supercomputing (GCS)

Project: Simulations of Dynamic Fracture and Fragmentation in Hard Rock Excavation

Grant: 9.0 million core-h (2020-21), 3.75 million core-h (2019-20), and 8.50 million core-h (2018-19) on JUWELS supercomputer at JSC-Forschungszentrum Jülich.

SFB837   Collaborative Research Center 837: Interaction Modeling in Mechanized Tunneling

Subproject: Simulation of processes at the Cutting Wheel and in the Excavation Chamber

Engagement: In proposal writing and Execution (2019-23)

Other Engagements and Memberships

Member of the German Association for Computational Mechanics (GACM).

Member of the Gesellschaft für Angewandte Mathematik und Mechanik (GAMM).

Reviewer for *Journal of Peridynamics and Nonlocal Modeling.*

Conception, development and organization of the yearly Colloquium 'CRUST' (*Colloquium for young Researchers in Underground Science and Technology*).

Peer-Reviewed Articles

1. S. N. Butt, and G. Meschke. Peridynamic simulations of rock indentation. *Proceedings in Applied Mathematics and Mechanics (PAMM)*: e202300051, 2023.
2. L. Brackmann, A. Röttger, H. Bui, S. N. Butt, G. Hoormazdi, A. Leon, S. Priebe, D. Wingender, H. Yang, D. Balzani, K. Hackl, G. Meschke, I. Mueller, J. Renner. Excavation Simulations and Cutting Tool Wear. *Springer Nature Switzerland*, 93-164, 2023.
3. S. N. Butt, and G. Meschke. Influence of dimensionality and specimen size on dynamic fracture. *Proceedings in Applied Mathematics and Mechanics (PAMM)*, 21.1: e202100207, 2021.
4. S. N. Butt, and G. Meschke. Peridynamic analysis of dynamic fracture: influence of peridynamic horizon, dimensionality and specimen size. *Computational Mechanics*, 67: 1719-1745, 2021.

5. S. N. Butt, and G. Meschke. Interaction of cutting disc with heterogeneous ground. *Proceedings in Applied Mathematics and Mechanics (PAMM)*, 20.1: e202000060, 2021.

6. S. N. Butt, and G. Meschke. Peridynamic investigation of dynamic brittle fracture. *Proceedings in Applied Mathematics and Mechanics (PAMM)*, 19.1: e201900180, 2019.

7. S. N. Butt, and G. Meschke. A rate-dependent damage model for prediction of high-speed cracks. *Proceedings in Applied Mathematics and Mechanics (PAMM)*, 18.1: e201800330, 2018.

8. S. N. Butt, J. J. Timothy, and G. Meschke. Wave dispersion and propagation in state-based peridynamics. *Computational Mechanics*, 60: 725-738, 2017.

Selected Conference Proceedings

1. S. N. Butt, A. Leon, and G. Meschke. Numerical modeling of cutting tool-ground interaction. TBM DiGs 2022, Leoben, Austria.

2. S. N. Butt, and G. Meschke. Influence of peridynamic horizon on the evolution of kinetic energy near a crack tip. 14th World Congress on Computational Mechanics (WCCM 2020), Paris, France.

3. S. N. Butt, and G. Meschke. Computational Modeling of Rock excavation with TBM disc cutters. Proceedings of ETS Tunneling and Underground Construction Conference 2019, Luxor, Egypt.

4. S. N. Butt, A. A. Allah, I. Mueller. and G. Meschke. Computational analysis of cutting-disc-rock interaction in heterogeneous ground conditions. Proceedings of TBM DiGs 2019, Colorado, USA.

5. S. N. Butt, and G. Meschke. Peridynamic horizon - effects on wave dispersion and crack propagation velocity. Proceedings of the COMPLAS 2019, Barcelona, Spain.

6. S. N. Butt, and G. Meschke. Peridynamic analysis of dynamic fracture process in brittle solids. Proceedings of the CFRAC 2019, Braunschweig, Germany.

7. S. N. Butt, A. Leon, and G. Meschke. Mechanized excavation modeling in soft and hard ground conditions. GeoShanghai 2018, Shanghai, China.

8. S. N. Butt, and G. Meschke. Dynamic fracture modelling using Peridynamics. Forschungskolloquium Baustatik-Baupraxis 2018, Grasellenbach, Germany.

9. S. N. Butt, and G. Meschke. A 3D peridynamic model of rock cutting with TBM disc cutters. Proceedings of the 7th GACM Colloquium on Computational Mechanics 2017, Stuttgart, Germany.

Sahir Butt
March 4, 2024