

Julian Busch

I'm a PhD student in computer science at the [Database Systems and Data Mining \(DBS\)](#) group at LMU Munich, working on various topics in machine learning. My research focuses on learning representations of complex data, including graphs and high-dimensional data.

My areas of expertise include, but are not limited to, machine learning, deep learning, data mining, data science, artificial intelligence, big data management and analytics, and algorithm design.

I have 5+ years of research experience and 2+ years of experience working in industry and with industrial partners.

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 github.com/buschju

Education

04/2016 – 07/2021 (expected)

Dr. rer. nat. (PhD) Computer Science

LMU Munich, Munich, Germany

Supervisor: Prof. Dr. Thomas Seidl

10/2013 – 03/2016

M.Sc. Computer Science

RWTH Aachen University, Aachen, Germany

Minor: Mathematics

Thesis supervisor: Prof. Dr. Thomas Seidl

GPA: 3.9/4.0 (German grading system: 1.30)

10/2009 – 09/2013

B.Sc. Computer Science

University of Hamburg, Hamburg, Germany

Minor: Applied Bioinformatics

Thesis supervisor: Prof. Dr. Ulrike von Luxburg

GPA: 4.0/4.0 (German grading system: 1.12)

Awarded as best bachelor graduate

Experience

04/2016 - present

LMU Munich - Research Assistant

Database Systems and Data Mining Group

Munich, Germany

05/2021 – 06/2021

Kiel University - Visiting Scholar
Information Systems and Data Mining Group
Kiel, Germany

04/2019 – 09/2019

Siemens Corporate Technology - Research Intern
Research Group for Big Data and AI Technology for Business Analytics and Monitoring
Princeton, NJ, USA

11/2018 – 12/2018

George Mason University - Visiting Scholar
Department of Geography and Geoinformation Science
Fairfax, VA, USA

05/2015 – 02/2016

RWTH Aachen University - Student Research Assistant
Data Management and Data Exploration Group
Aachen, Germany

12/2010 – 03/2011

University of Hamburg - Student Teaching Assistant
Discrete Mathematics Group
Hamburg, Germany

Industry Projects

Third-party funded research projects at LMU Munich.

03/2018 – 09/2018

Explanation of Classification Results on Multivariate Time Series by Convolutional Neural Networks
Siemens AG

09/2017 – 02/2018

Data-driven Methods for Pre-Ignition Cause Analysis
IAV Automotive Engineering GmbH

Supervised external master theses at LMU Munich.

07/2020 – 01/2021

Federated ClusterGAN: Latent Space Clustering on Decentralized Datasets
Rohde & Schwarz GmbH & Co. KG

Publications

NF-GNN: Network Flow Graph Neural Networks for Malware Detection and Classification

Julian Busch, Anton Kocheturov, Volker Tresp, and Thomas Seidl

International Conference on Statistical and Scientific Database Management (SSDBM), 2021

Best Paper Runner-Up Award

[\[pdf\]](#)

Learning Self-Expression Metrics for Scalable and Inductive Subspace Clustering

Julian Busch, Evgeniy Faerman, Matthias Schubert, and Thomas Seidl

NeurIPS Workshop: Self-Supervised Learning - Theory and Practice, 2020

[\[pdf\]](#) [\[poster\]](#) [\[code\]](#)

Ada-LLD: Adaptive Node Similarity for Node Classification Using Multi- Scale Local Label Distributions

Evgeniy Faerman, Felix Borutta, Julian Busch, and Matthias Schubert

IEEE/WIC/ACM International Joint Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT), 2020

Best Student Paper Award

[\[pdf\]](#)

Grace – Limiting the Number of Grid Cells for Clustering High-Dimensional Data

Anna Beer, Daniyal Kazempour, Julian Busch, Alexander Tekles, and Thomas Seidl

Conference on Learning, Knowledge, Data, and Analysis (LWDA), 2020

[\[pdf\]](#)

PushNet: Efficient and Adaptive Neural Message Passing

Julian Busch, Jiaxing Pi, and Thomas Seidl

European Conference on Artificial Intelligence (ECAI), 2020

[\[pdf\]](#) [\[slides\]](#) [\[talk\]](#) [\[code\]](#)

Structural Graph Representations based on Multiscale Local Network Topologies

Felix Borutta, Julian Busch, Evgeniy Faerman, Adina Klink, and Matthias Schubert

IEEE/WIC/ACM International Joint Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT), 2019

[\[pdf\]](#)

Semi-Supervised Learning on Graphs Based on Local Label Distributions

Evgeniy Faerman, Felix Borutta, Julian Busch, and Matthias Schubert

International Workshop on Mining and Learning with Graphs at ACM SIGKDD (MLG), 2018

[\[pdf\]](#)

Towards Learning Structural Node Embeddings using Personalized PageRank

Felix Borutta, Julian Busch, Evgeniy Faerman, and Matthias Schubert

Conference on Learning, Knowledge, Data, and Analysis (LWDA), 2017

[\[pdf\]](#)

Teaching Experience

Teaching assistance at LMU Munich.

Algorithm Design (Elite master's program Data Science)

Lecture

[Winter 2019](#)

Big Data Management and Analytics

Lecture

[Winter 2017](#)

Innovation Lab Big Data Science

Practical

[Summer 2017](#)

Knowledge Discovery in Databases I

Lecture

[Summer 2016](#), [Winter 2018](#)

Knowledge Discovery in Databases II

Lecture

[Summer 2020](#)

Machine Learning

Lecture

[Summer 2018](#)

Recent Developments in Data Science

Seminar

[Winter 2016](#), [Summer 2017](#), [Summer 2021](#)

Software Development Lab

Practical

[Summer 2016](#), [Winter 2016](#), [Winter 2020](#), [Summer 2021](#)

Supervised Theses

Bachelor and master thesis supervision at LMU Munich.

2020

Neural Hough Transform for Subspace Clustering

Master Thesis

Generalized Neighborhood Aggregation for Graph Neural Networks

Bachelor thesis

Federated ClusterGAN: Latent Space Clustering on Decentralized Datasets

Master thesis

2019

Neural End-To-End Subspace Clustering

Master thesis

Spatio-Temporal Link Prediction

Bachelor thesis

Inductive Subspace Clustering

Master thesis

2018

Recommendations on Dynamic Heterogeneous Networks with Metapath-RNNs

Master thesis

Deep Conformance Checking

Bachelor thesis

Graph Classification

Bachelor thesis

2017

Dynamically Adapting Vertex Embeddings

Bachelor thesis

2016

Visualizing High-Dimensional Data with t-SNE

Bachelor Thesis

Accelerating Minimax Hierarchical Clustering

Bachelor Thesis

Academic Service

External reviews for academic conferences, journals and workshops.

- **CIKM** [2017](#), [2020](#)
- **Computers and Security** [2021](#)
- **DAMI** [2019](#), [2020](#), [2021](#)
- **DSAA** [2018](#)
- **ECIR** [2021](#)
- **EDBT** [2018](#)
- **ICDE** [2018](#)
- **IDEA** [2016](#)
- **KDD** [2019](#), [2020](#)
- **Machine Learning** [2017](#)
- **Pattern Recognition** [2020](#)

Selected Skills

Languages

C, C++, CSS, HTML, Java, Latex, Markdown, Matlab, Python, R, SQL

Frameworks

Bokeh, DGL, Keras, MLflow, Matplotlib, NetworkX, Numba, NumPy, Pandas, PyTorch, PyTorch
Geometric, Scikit-Learn, SciPy, Seaborn, Spark, Tensorflow

Tools

Docker, Git, Linux, Slurm

Soft Skills

Certificate of advanced training in self-management, leadership and teaching skills awarded
by the [LMU Center for Leadership and People Management](#)

Natural Languages

German (native), English (proficiency), Latin (Latinum), Mandarin (beginner), French
(beginner)