

# Sebastian Kusch

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Nationality: German

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## EDUCATION

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- **Ph.D., Network Science (Currently)** Vienna, Austria  
*Central European University, Vienna* *Oct. 2022 – Present*
  - **Topic:** "Disentangling Co-Existing Network Generating Mechanisms"
  - **Supervised by:** Tiago Peixoto
- **M.Sc., Environmental Modelling** Oldenburg, Germany  
*Carl von Ossietzky University of Oldenburg* *Oct. 2018 – May. 2022*
  - **Thesis:** "Steady State Solutions of Evolutionary and Interaction-based Multi-Layer Spreading Processes"
  - **Supervised by:** Thilo Gross, Jan Freund
- **B.Sc., Simulation Technology** Stuttgart, Germany  
*University of Stuttgart* *Oct. 2013 – May. 2017*
  - **Thesis:** "Modelling and Simulation of Muscle Hypertrophy, Fatigue and Maximum Force Increase in Performance-oriented Training"
  - **Supervised by:** Syn Schmitt, Daniel Häufle

## RESEARCH INTERESTS

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- **Network Science:** Network Inference, Network Reconstruction, Network Algorithms.
- **Complex Systems:** Statistical Physics, Algorithmic Information Theory, Emergence.
- **Data Science:** Bayesian Inference, Machine Learning, Data Compression.

## RESEARCH EXPERIENCE

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- **Research Internship** Oldenburg, Germany  
*Helmholtz Institute for Functional Marine Biodiversity* *Mar. 2020 – Jul. 2020*
  - **Biodiversity Theory:** Using diffusion maps to find patterns in ecological models and data sets, scientific report titled "Functional patterns in ecological systems"
  - **Mathematical Modelling:** Using the Julia language to model ecological systems(food webs, competition models) and run dynamical simulations and algorithms (non-official Julia package at DiffusionMap.jl)
- **Research Internship** Oldenburg, Germany  
*BTC Business Technology Consulting AG / Team Data Science and Artificial Intelligence* *Nov. 2019 – Feb. 2020*
  - **Programming Project:** Title: "Conception and implementation of a testing environment for an artificial intelligent system in the context of autonomous driving".
  - **Reinforcement Learning Project:** Title: "Conception and implementation of an artificial intelligent reinforcement learning agent with the purpose of driving autonomously".
- **Student Research Assistant** Oldenburg, Germany  
*Institute for Chemistry and Biology of the Marine Environment, University Oldenburg* *Mar. 2019 – Jan. 2020*
  - **Non-linear Dynamics Project:** Attractor Reconstruction in Julia
  - **Visualization Project:** Web based visualization of bird migration models, written in JavaScript and HTML (see [github.com/bastikusch/birdmigration](https://github.com/bastikusch/birdmigration))
- **Student Research Assistant** University Stuttgart, Germany  
*Institute for Sports and Movement, University of Stuttgart* *Jul. 2015 – Nov. 2016*
  - **Biomechanics Project:** Research projects addressing biomechanical modelling and simulations (data aggregating experiments and programming in Matlab).

## TEACHING EXPERIENCE

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- **Certificate of Teaching in Higher Education** Vienna, Austria  
*Yehuda Elkana Center, CEU, Vienna* *Sep. 2023 – Jun. 2024*
  - **Certificate [16 ECTS]:** Teaching program integrating scholarship, practice, and innovation in teaching, equipping participants to design effective courses, master student-centered teaching techniques, and assess student learning. Additional focus on utilizing technology, promoting diversity and inclusion, and fostering lifelong professional development through reflective practices.
- **Teaching Assistant** Vienna, Austria  
*Central European University*
  - **Multivariate Calculus (Spring 24):** Weekly tutorial sessions, additional Q&A sessions, design and grade assignments.
  - **Introduction to Optimization (Winter 23/24):** Supervise and grade group presentations, office hours, design and grade assignments.
  - **Numerical Methods in Calculus and Algebra (Fall 23/24):** Supervise and grade group presentations, office hours, design and grade assignments.
- **Teaching Assistant** Stuttgart, Germany  
*University of Stuttgart*
  - **Engineering Mechanics 2 (Summer 15):** Weekly tutorial group, Correct exercises, Assist in grading the final exam.
  - **Engineering Mechanics 1 (Winter 14/15):** Weekly tutorial group, Correct exercises, Assist in grading the final exam.

## AWARDS & HONORS

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- **Best talk by an early career researcher:** NetSci 2024, Quebec
- **Academic Achievement Award for First-Year Doctoral Students 2023/24:** CEU, Vienna

## COMMUNITY SERVICE AND OUTREACH

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- **NetPLACE Seminars**  
*Organiser* *Sep. 2023 – Present*
  - **Online Seminars:** Co-organize bi-weekly online seminars, focusing on early career researchers and the problems they encounter in academia.
  - **Panel, NetSci-X 2024, Venice:** Co-organized a panel with the title "Redefining scientific communication: from the scientific community to the society"

## WORK EXPERIENCE

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- **Developer** Oldenburg, Germany  
*BTC Business Technology Consulting AG / Team Data Science and Artificial Intelligence* *Mar. 2020 – Jun. 2021*
  - **AI Projects:** geometric optimization of lane reconstructions, quantification of simulation uncertainties, heuristic search algorithms for dimension reduction problems and conception of metric search tree data structures.
- **European Voluntary Service** Galway, Ireland  
*Youth Work Ireland Galway, YWIG* *Oct. 2017 – Aug. 2018*
- **Voluntary Social Year** Frankfurt, Germany  
*FRAPORT SKYLINERS e.V.* *Aug. 2012 – Jul. 2013*

## SKILLS

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- **Languages:** German (native), English (fluent), French, Spanish, Swedish (all basic)
- **Programming:** Python, Julia, C#, HTML, JavaScript, Latex, Git