

# Johannes Lutzeyer

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## EDUCATION

### Imperial College London

- Oct. 2015 – Feb. 2020 PhD in Statistics (funded by: EPSRC) — supervised by Prof. Andrew T. Walden  
“Network Representation Matrices and their Eigenproperties: A Comparative Study”
- Topic includes: community detection, graphical and latent space modelling, and spectral analysis.
  - Lecture subjects include: Deep Learning; Wavelets and Applications; Topics in Large Dimensional Data Processing; Graph Theory; Random Matrix Theory; Statistical Methods for Big Data.
  - Undertaking research work to solve advanced statistical and mathematical problems, contributing to and understanding the current statistical research literature and communicating technical solutions clearly in written and oral form.
- Oct. 2014 – Sept. 2015 MSc Statistics (Distinction, funded by: “Studienstiftung des deutschen Volkes”)
- Thesis title: “Automated Control Point Image Registration” – supervised by Dr. Edward A. K. Cohen.
  - Main Subjects: Non-Parametric Smoothing and Wavelets; Time Series; Computational Statistics; Applied Statistics; Bayesian Data Analysis; Statistics for Extreme Events; Graphical Models.
  - Built up a very well founded applied and theoretical knowledge of Statistics. It ensures complete understanding of the basis and comprehension of the advanced issues in Statistics.
- Oct. 2011 – June 2014 BSc Mathematics (First Class Honours)
- Main Subjects: Scientific Computation (Introduction to C); Statistical Pattern Recognition; Group Theory; Applied Probability; Statistical Modelling; Stochastic Simulation; Games Risks and Decisions.
  - These subjects provide me with a good basis to analyse data and understand statistical models. This degree equips me with the skill to systematically break up and solve problems.
- Sept. 2001 – July 2011 European Baccalaureate (Final Grade: 92%)  
European School Brussels Woluwe
- Subjects included: Mathematics, Physics, Chemistry, Biology, Philosophy and ICT.

## WORK EXPERIENCE

- Sept. 2022 – Present Assistant Professor in the Data Science and Mining (DaSciM) Team  
Laboratoire d’Informatique (LIX), École Polytechnique, Institut Polytechnique de Paris
- Conducting research in the areas of Graph Representation Learning and Graph Neural Networks.
  - Contributing to the teaching of: Machine & Deep Learning (B3/M1), Advanced Learning for Text and Graph Data (M2), Data Science Starter Program, Image Analysis (B3/M1), Machine Learning (B2).
  - Organising and running weekly seminar series (speaker recruitment, advertisements, charring sessions).
  - Closely collaborating with and participating in the supervision of two PhD students.
- March 2020 – Aug. 2022 Postdoctoral Researcher in the Data Science and Mining (DaSciM) Team  
Laboratoire d’Informatique (LIX), École Polytechnique, Institut Polytechnique de Paris
- Conducting research in the areas of Graph Representation Learning and Graph Neural Networks.
  - Awarded Seal of Excellence from the European Commission for a MSCA proposal submitted to H2020 and assisting in the submission of 1 ANR and 3 CAP Digital funding proposals.
  - Responsible for the project management of DaSciM’s research collaboration with SEPHORA & LVMH.
  - Organising and running weekly seminar series (speaker recruitment, advertisements, charring sessions).
  - Closely collaborating with and participating in the supervision of two M1 and five PhD students.
  - Contributing to the groups’ teaching effort in four different courses.

- Oct. 2014 – Sept. 2019 **Graduate Teaching Assistant (GTA) and Tutor**  
Imperial College London
- Awarded Associate Fellowship of the Higher Education Academy (AFHEA) for my conscious approach and significant contribution to the Department’s teaching.
  - GTA tasks include: preparing and delivering lectures on test solutions, demonstrating in problem classes, providing feedback to lecturers to improve the courses and marking of coursework and exams.
  - Privately tutored an MSc Statistics student in “Fundamentals of Statistical Inference.”
- June 2015 – Sept. 2019 **Subwarden**  
Gabor Hall, Imperial College London
- Responsible for supporting students suffering from mental instability/health issues, scheduling and leading of discipline meetings and running of large-scale events with 50-400 attendees.
  - Holding an emergency phone acting as a point of first contact.
  - Reviewing subwarden and senior applications and being part of the interview panel on 12 occasions.
  - Requires a high amount of teamwork in the warden team and effective leadership to coordinate the team of 8 UG seniors in order to run social hall events.
  - Training courses: Mental Health First Aid, Emergency First Aid at Work, Fire Prevention, Subwarden training day (learning how to lead discussions in a range of scenarios aided by professional actors).
- July – Aug. 2014 **Business Intelligence Intern**  
Rocket Internet, Berlin
- Worked in a team to build and maintain the business reporting system of several start-ups. This included extracting data from several sources, loading it to a data warehouse and then processing it.
  - Independently designed and coded a quality assurance tool guaranteeing integrity of database loads.
  - Further developed ability to work under pressure and facilitated frictionless communication in a team.
- July 2012 – June 2015 **Hall Senior**  
Falmouth & Keogh Hall, Imperial College London
- Worked in a team of 10 students and one lecturer to help 150 new students in our hall to settle in London and organised and ran large scale events such as: trips to European capitals and parties.
  - Requires a great deal of teamwork, crowd management and ability to organise large events.

## ACHIEVEMENTS.....

- Invited Talks**
- “Graph Representation Learning via Graph Neural Networks,” LIX Seminar Series, October 2022. Link to [Event Page](#) & [Recording](#).
  - “Graph Ordering Attention Networks,” Learning on Graphs and Geometry Reading Group, June 2022. Link to [Event Page](#) & [YouTube Recording](#).
  - “Graph Shift Operators and Their Relevance to Graph Neural Networks” (*Keynote talk*), Recent Advances in Graph Machine Learning Workshop, March 2022. Link to [Event Page](#).
  - “Learning Parametrised Graph Shift Operators,” Learning on Graphs and Geometry Reading Group, Jan. 2022. Link to [Event Page](#) & [YouTube Recording](#).
  - “Extending the Davis-Kahan theorem for the comparison of embedding spaces spanned by eigenvectors,” LIX, Feb. 2020. Link to [Event Page](#).
- Prizes**
- Member of the winning team: “Medical data dive” – 5 day hackathon, Imperial College London, 2019.
  - Winton Capital Prize for overall best student in my MSc cohort, 2015.
  - Warner Prize for best MSc project in my MSc cohort, 2015.
- Memberships**
- Alumni of German National Academic Foundation (“Studienstiftung des deutschen Volkes”), which has a very competitive selection process. Active membership Jan. 2012 - Sept. 2015.
  - Member of the alumni organization “Club der Ehemaligen der Deutschen Schüler Akademien” after being selected to participate in a 2-week course on Complex Chemistry in 2010.
- Summer Academies**
- “Scientific Computing in the age of Exascale” – 2-week-long academy to which I contributed a presentation entitled: “Fault tolerant GMRES and Inner-Outer solvers,” Krakow, 2014.
  - “Randomised Algorithms and Randomness” – 2-week-long academy to which I contributed a presentation entitled: “Multiplicative hashing and the closest pair problem in linear time,” Görlitz, 2013.

## PUBLICATIONS

### Peer-reviewed Publications

- M. Chatzianastasis, J. F. Lutzeyer, G. Dasoulas & M. Vazirgiannis, “Graph Ordering Attention Networks,” *AAAI Conference on Artificial Intelligence (AAAI)*, 2023.
- G. Salha-Galvan, J. F. Lutzeyer, G. Dasoulas, R. Hennequin & M. Vazirgiannis, “New Frontiers in Graph Autoencoders: Joint Community Detection and Link Prediction,” *NeurIPS New Frontiers in Graph Learning Workshop*, 2022.
- A. R. Ramos Vela, J. F. Lutzeyer, A. Giovanidis & M. Vazirgiannis, “Improving Graph Neural Networks at Scale: Combining Approximate PageRank and CoreRank,” *NeurIPS New Frontiers in Graph Learning Workshop*, 2022.
- A. Qabel, S. Ennadir, G. Nikolentzos, J. F. Lutzeyer, M. Chatzianastasis, H. Bostrom & M. Vazirgiannis, “Structure-Aware Antibiotic Resistance Classification Using Graph Neural Networks,” *NeurIPS AI for Science Workshop*, 2022.
- G. Salha-Galvan, J. F. Lutzeyer, G. Dasoulas, R. Hennequin & M. Vazirgiannis, “Modularity-Aware Graph Autoencoders for Joint Community Detection and Link Prediction,” *Neural Networks*, vol. 153, pp. 474–495, 2022.
- J. F. Lutzeyer\*, C. Wu\* & M. Vazirgiannis, “Sparsifying the Update Step in Graph Neural Networks,” *ICLR Workshop on Geometrical and Topological Representation Learning*, 2022. \*equal contribution
- M. E. A. Seddik, C. Wu, J. F. Lutzeyer & M. Vazirgiannis, “Node Feature Kernels Increase Graph Convolutional Network Robustness,” *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022.
- G. Dasoulas\*, J. F. Lutzeyer\* & M. Vazirgiannis, “Learning Parametrised Graph Shift Operators,” *International Conference of Learning Representations (ICLR)*, 2021. \*equal contribution
- J. F. Lutzeyer & A. T. Walden, “Comparing Spectra of Graph Shift Operator Matrices,” *International Conference on Complex Networks and their Applications*, 2020.

### Published Preprints

- J. F. Lutzeyer & A. T. Walden, “Extending the Davis-Kahan theorem for comparing eigenvectors of two symmetric matrices I: Theory,” *arXiv:1908.03462*, 2019.
- J. F. Lutzeyer & A. T. Walden, “Extending the Davis-Kahan theorem for comparing eigenvectors of two symmetric matrices II: Computation and Applications,” *arXiv:1908.03465*, 2019.
- J. F. Lutzeyer & E. A. K. Cohen, “Correcting the estimator for the mean vectors in a multivariate errors-in-variables regression model,” *arXiv:1510.03600*, 2015.

## TEACHING EXPERIENCE

- 2022** “Advanced Learning for Text and Graph Data” (60 M2 students, MVA Master)  
6 hours – teaching labs (Python).
- “INF554: Machine and Deep Learning” (150 B3/M1 students, École Polytechnique)  
36 hours – teaching labs (Python); marking written assessments (22).
- “INF537: Image Analysis and Computer Vision” (60 B3/M1 students, École Polytechnique)  
23 hours – teaching lectures (2 hours) and labs (21 hours, Python);  
marking written assessments (120).
- “Data Mining” (15 M1 students, SPEIT - ParisTech Shanghai Jiao Tong Partnership)  
3 hours – teaching labs (Python).
- “Data Science Starter Program” (20 professionals, École Polytechnique Executive Education)  
14 hours – teaching lectures (14 hours).
- “Research Internship” (1 M1 student, École Polytechnique)  
15 weeks – co-drafted project abstract; co-supervised student in weekly meetings.
- 2021** “Advanced Learning for Text and Graph Data” (60 M2 students, MVA Master)  
8 hours – teaching labs (Python); marking oral (11) and written assessments (33).
- “INF554: Machine and Deep Learning” (150 B3/M1 students, École Polytechnique)  
18 hours – teaching labs (Python); marking oral (14) and written assessments (23).
- “Data Mining” (11 M1 students, SPEIT - ParisTech Shanghai Jiao Tong Partnership)  
7.5 hours – teaching labs (Python); marking written assessments (11).
- “Data Science Starter Program” (20 professionals, École Polytechnique Executive Education)  
35 hours – teaching lectures (14 hours) and labs (21 hours, Python).

- 2020 “*Advanced Learning for Text and Graph Data*” (60 M2 students, MVA Master)  
4 hours – teaching labs (Python); marking oral (6) and written assessments (16).  
“*INF554: Machine and Deep Learning*” (150 B3/M1 students, École Polytechnique)  
18 hours – teaching labs (Python); marking oral (14) and written assessments (16).  
“*Data Science Starter Program*” (20 professionals, École Polytechnique Executive Education)  
14 hours – teaching labs (Python).
- 2017 “*M2S1: Probability and Statistics II*” (200 B2 students, Imperial College London)  
11 hours – lecturing test solutions (1 hour); teaching labs(10 hours);  
marking written assessments (135).  
“*M34S2: Statistical Modelling II*” (100 B3/M1 students, Imperial College London)  
10 hours – teaching labs (R); marking written assessments (30).  
“*M1S: Probability and Statistics I*” (250 B1 students, Imperial College London)  
second marking 2 hour exams for all 250 students.
- 2016 “*M1S: Probability and Statistics I*” (250 B1 students, Imperial College London)  
10 hours – teaching labs; marking written assessments (135);  
inviolating January exam.  
“*M2S2: Statistical Modelling I*” (150 B2 students, Imperial College London)  
second marking 2 hour exams for all 150 students.
- 2015 “*M1S: Probability and Statistics I*” (250 B1 students, Imperial College London)  
10 hours – teaching labs; marking written assessments (135).  
“*M345S8: Time Series*” (112 B3/M1 students, Imperial College London)  
marking written assessments (112).  
“*Drop-In Problem Class*” (250 B1/B2 students, Imperial College London)  
10 hours – teaching labs.  
“*Student Tutorial*” (5 B1 students, Imperial College London)  
10 hours – teaching tutorials with freedom to design content.

## REVIEWING FOR JOURNALS & BOOK PROPOSAL .....

- 2022 - Present *Transactions on Intelligent Systems and Technology*, ACM (3 review)  
2022 *Book Proposal on a Topic Related to Graphs*, Cambridge University Press (1 review)
- 2021 - Present *Transactions on Knowledge and Data Engineering*, IEEE (12 reviews)  
2021 - Present *Applied Intelligence*, Springer (14 reviews)  
2021 - Present *Neurocomputing*, Elsevier (3 reviews)
- 2021 *Mathematics*, MDPI (3 reviews)  
2021 *Symmetry*, MDPI (2 reviews)  
2021 *Semantic Web Journal*, IOS Press (2 reviews)  
2019 *Nonlinear Theory and Its Applications*, IEICE (2 reviews)

## PERSONAL SKILLS .....

- Languages German (mother tongue), English (Fluent), French (Intermediate)
- Computer Proficient use of Python (Tensorflow, PyTorch), R, MATLAB, SQL, C and Maple.
- Communication
  - Interpersonal skills (gained as a Subwarden responsible for UG student welfare, when working with business partners of Rocket Internet and as Representative on open day events at Imperial College).
  - International and multilingual communication (highly international environment at the European School of Brussels, at Imperial College London and at École Polytechnique).
  - Public speaking, e.g., lecturing test solutions to 200 UG students at Imperial College London & labs to 150 UG students at École Polytechnique.
- Organisational / Managerial
  - Experienced organiser and self-confident (after planning and running numerous big scale events).
  - Leadership (leading the hall senior team and as Imperial Ambassador at a Robotics Summer School).