

# Mehdi Bahri

*Machine Learning Engineer & PhD Student in Geometric Deep Learning*

m.bahri@imperial.ac.uk • +44 7706 783726 • <https://fr.linkedin.com/in/mehdibahri/en> • <http://bahri.io>

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## Education

- Imperial College London LONDON, UNITED KINGDOM  
**PhD. Computer Science** 2017 – (2022)  
Geometric Deep Learning & Generative Models on Graphs and Manifolds.  
*Supervisors: Prof. Stefanos Zafeiriou & Prof. Michael Bronstein.*
- MSc. Advanced Computing - Distinction (84%)** 2015 – 2016  
Focus on statistical machine learning.  
**Thesis:** Robust Low-Rank modeling on Tensors: New Algorithms and Extensive Comparisons.  
*Awarded the Winton Capital Advanced Computing MSc Project Prize.*
- Grenoble INP - Ensimag GRENOBLE, FRANCE  
**BSc. and MSc. Applied Mathematics and Computer Science - with High Honours** 2013 – 2016  
Focus on statistics, numerical optimization, numerical analysis, databases, software engineering.  
*2010 - 2013: Classes Préparatoires aux Grandes Écoles PC\* - Lycée Chateaubriand, Rennes, France.*
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## Publications

1. **M. Bahri**, G. Bahl, and S. Zafeiriou, "Binary Graph Neural Networks", in CVPR 2021 ([arXiv:2012.15823](#))
2. **M. Bahri**, E. O' Sullivan, S. Gong, F. Liu, X. Liu, M. Bronstein, and S. Zafeiriou, "Shape My Face: Registering 3D Face Scans by Surface-to-Surface Translation", in International Journal of Computer Vision (IJCV), 2021 ([arXiv:2012.09235](#))
3. S. Gong\*, **M. Bahri\***, S. Zafeiriou, and M. Bronstein, "Geometrically Principled Connections in Graph Neural Networks", in CVPR 2020 ([arXiv:2004.02658](#))
4. **M. Bahri**, Y. Panagakis, and S. Zafeiriou, "Robust Kronecker Component Analysis" in IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI) 2019 ([arXiv:1801.06432](#))
5. **M. Bahri**, Y. Panagakis, and S. Zafeiriou, "Robust Kronecker-Decomposable Component Analysis for Low Rank Modeling" in International Conference on Computer Vision (ICCV) 2017 ([arXiv:1703.07886](#))
6. N. Xue, G. Papamakarios, **M. Bahri**, Y. Panagakis, and S. Zafeiriou, "Robust Low-rank Tensor Modelling Using Tucker and CP Decomposition" in European Signal Processing Conference (EUSIPCO) 2017

\* denotes equal contributions.

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## Patents

1. "Method of generating a latent vector", UK Patent Application (filed), 2020
  2. "Generative geometric neural networks for 3D shape modelling", US Patent Application (filed), 2020
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## Professional Experience and Selected Projects

- Cogitat.io - Machine Learning Engineer LONDON, UK  
**EEG Signal Analysis for BCI** 06/21 - present
  - Investigating novel ML approaches for EEG signal decoding
  - Applications to brain-computer interfaces in healthcare and entertainment
- Google AI - Research Intern NEW YORK, NY  
**Machine Intelligence & Machine Perception** 10/18 - 01/19
  - Robust generative models for meshes, pooling on meshes
  - Implementation in TensorFlow, Python, C++
- JPMorgan Chase & Co - Quantitative Associate Intern LONDON, UNITED KINGDOM  
**Equities Systematic Trading QR** 06/18 - 08/18
  - Quantitative Research Off-Cycle Internship in Machine Learning
  - Time series forecasting and volatility modeling for automated trading of single stocks options

Speechmatics (Cantab Research Ltd.) - Speech Recognition Intern CAMBRIDGE, UNITED KINGDOM  
**Research & Development** 04/17 - 07/17

- Improved the RNN language models by implementing research papers in TensorFlow and C++
- Divided model size by 4 while keeping the same cross-entropy loss / perplexity and WER

HarperCollins Publishers - Data Scientist LONDON, UNITED KINGDOM  
**Global Pricing and Analytics** 09/16 - 03/17

- Graph mining and influence maximization to maximize uplift of books on special offers
- Analyzed MongoDB databases of more than 100Gb with scikit-learn and networkx

Imperial College London - Master's Thesis LONDON, UNITED KINGDOM  
**Robust Low-Rank Modeling on Tensors: New Algorithms and Extensive Comparisons** 04/16 - 09/16

- Devised 4 ADMM solvers and a Variational Bayes algorithm for robust tensor factorizations (MATLAB)
- Compared against 11 state-of-the-art methods on computer vision benchmarks
- Analyzed 500Gb of experimental data, showed improvements of up to 16% higher PSNR and FSIM
- Published in top venue

*Supervisors: Prof. Stefanos Zafeiriou & Dr Yannis Panagakis.*

Morgan Stanley - Summer Analyst (Tech & Data) LONDON, UNITED KINGDOM  
**Full-stack development of a trade control system prototype** 06/15 - 09/15

- Software engineering (Java, Javascript, git flow, legacy code, tests, architecture design)
- Presented at the global meeting of the sub-department, project continued for integration into production

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## Awards and Scholarships

2019	Qualcomm Innovation Fellowship Europe (\$40 000 - one year)
2019	Amazon AWS Cloud Credits for Research (\$6000)
2019	IPAM (UCLA) <i>Geometry and Learning from Data in 3D and Beyond</i> Workshops II and IV travel grants
2018	Google Computer Vision Summit <i>fully-funded invitation to Google Zürich</i>
2017	Full PhD Scholarship from the Department of Computing, Imperial College London
2016	Winton Capital Advanced Computing MSc Project Prize (£1200) <i>best thesis in Computer Science (1/188 students)</i>

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## Presentations and Talks

2021	Binary Networks for Computer Vision Workshop at CVPR ( <i>Binary Graph Neural Networks</i> )
2021	DiffCVML Workshop at CVPR ( <i>Shape My Face</i> )
2021	Embedded Vision Workshop at CVPR ( <i>Binary Graph Neural Networks &amp; Shape My Face</i> )
2021	Graph Neural Networks User Group (Invited Speaker: <i>Binary Graph Neural Networks and Dynamic Graph Models</i> )
2021	Invited talk at Autodesk Research
2019	Qualcomm - San Diego Headquarters (two talks to ML team and CV team)
2019	KCL/UCL Junior Geometry Seminar (Invited Speaker: <i>Introduction to Geometric Deep Learning</i> )
2018	Presented poster at the Google Computer Vision Summit
2017	Presented poster at the <i>Official Launch of the Machine Learning Initiative</i> at Imperial College London

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## Skills

	Computing skills	Languages
Programming ( <i>advanced</i> )	Python, Java, C, Shell	French <i>Native</i>
Programming ( <i>intermediate</i> )	SQL, Javascript, Prolog, C++	English <i>Fluent</i>
Modeling	MATLAB, R, NumPy, TensorFlow, Scikit-learn, Pytorch	Spanish <i>Intermediate</i>
Tools	Git, L <sup>A</sup> T <sub>E</sub> X, MongoDB	

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## Community Service and Leadership

2019 - 2021	Co-organizer of the <i>London Geometry and Machine Learning Summer School (LOGML.ai) 2021</i>
2019 - current	Reviewer for IEEE T-PAMI, IEEE T-SMC:Systems

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## Interests

Fitness & Nutrition • Cycling • Cooking

REFERENCES AVAILABLE UPON REQUEST.