

# GERGELY FLAMICH

Imperial College London, London, UK

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## PERSONAL STATEMENT

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From August 2025, I am an [Imperial College Research Fellow](#) in the Information Processing and Communications Lab at Imperial College London. I have deep expertise in machine learning with strong practical and theoretical research and coding skills. My current work focuses on **neural data compression** and related **information theory**.

## ACADEMIC POSITIONS

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**Imperial College Research Fellow**, Imperial College London

*Aug 2025 - July 2029*

**Sponsor:** Dr Deniz Gündüz

**Research Associate in Machine Learning and Wireless Communications**, Imperial College London

*March 2025 - July 2025*

**Principal Investigator:** Dr Deniz Gündüz

## EDUCATION

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**PhD in Machine Learning (St John's College, Cambridge)**

*Oct 2020 - July 2025*

**Supervisor:** Dr José Miguel Hernández-Lobato

**Thesis:** Data Compression with Relative Entropy Coding

**Committee:** Dr Po-Ling Loh and Dr Chris Maddison

**MPhil in Machine Learning and Machine Intelligence (St John's College, Cambridge)**

*Oct 2018 - Oct 2019*

**Graduated with Commendation**

**Courses taken:** Deep Learning, Probabilistic Machine Learning, Computer Vision, Reinforcement Learning, Natural Language Processing, Speech Recognition, Advanced Machine Learning, Statistical Machine Translation, Statistical Speech Synthesis, Control Theory, Introduction to Machine Learning, Probabilistic Automata

**Average grade:** 75% (A)

**Dissertation Topic:** Compression, Information Theory, Variational Auto-Encoders (**graded 80.5%**)

**BSc Joint Honours in Mathematics and Computer Science (University of St Andrews)**

*Sept 2014 - June 2018*

**Graduated as Valedictorian in Computer Science, with First Class Honours**

**Relevant achievements:** In my first year of studies, I implemented a **genetic algorithm** to find optimal playing strategies for the game Starcraft 2 in a very large search space, which was assessed by the department to be the best solution (**graded 100%**). As part of a third-year group project, I have implemented a **parallelised Monte Carlo Tree Search** agent to play the board game Catan (**graded 87.5%**).

**Average grade:** 86% (17.2 / 20)

**Dissertation Topic:** Cryptography, Fully Homomorphic Encryption (**graded 92.5%**)

## ACADEMIC ACHIEVEMENTS

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2025	Runner-up for the Jack Keil Wolf student paper award	ISIT 2025
2024	Expert Reviewer	<a href="#">Transactions on Machine Learning Research</a>
2024	Spotlight Paper Award	<a href="#">Learn to Compress Workshop @ ISIT 2024</a>
2023	Spotlight Paper Award	<a href="#">NeurIPS 2023</a> , a top venue for machine learning research.
2022	Highlighted Reviewer	<a href="#">ICLR 2022</a>
2021	Finalist	<a href="#">Qualcomm Innovation Fellowship</a>
2019	Commendation	University of Cambridge, <i>awarded for good performance in my MPhil</i>
2018	Adobe Prize	University of St Andrews, <i>highest average grade in Computer Science</i>
2018	Dean's List Award	University of St Andrews, <i>annual award for academic excellence</i>
2016	Dean's List Award	University of St Andrews, <i>annual award for academic excellence</i>
2015	Top of Class	First-Year Programming Projects
2013	2 <sup>nd</sup> Prize	International Hungarian Mathematics Competition

## WORK EXPERIENCE AND RELEVANT PROJECTS

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### **Student Researcher: Neural Machine Translation** Dec 2024 - Feb 2025

Google Berlin

Hosts: Dr David Vilar, Dr Jan-Thorsten Peter and Dr Markus Freitag

- Studied state-of-the-art discrete diffusion models to speed up neural machine translation.
- Developed the theory of the [accuracy-naturalness tradeoff](#) in translation
- Submitted findings to COLM 2025, paper expected to be accepted.

### **Student Researcher: Relative Entropy Coding for Practical Data Compression** July 2022 - Dec 2022

Google Brain, London

Host: Dr Lucas Theis

- Developed data compression algorithm that is significantly faster than previous comparable methods.
- Published work at [IEEE ISIT 2023](#).
- Contributed the noncentral  $\chi^2$  distribution to the popular open-source [Tensorflow Probability](#) package.

### **Research Assistantship: Bayesian Optimization & Data Compression** Oct 2019 - July 2020

University of Cambridge

Supervisor: Dr José Miguel Hernández-Lobato

- Collaborated with researchers from Intel and Harvard.
- Implemented black-box optimization pipeline to find optimal hardware designs.
- Our method consistently found better configurations faster than standard methods used in industry.
- Improved results from my Master's thesis and published it at [NeurIPS 2020](#).

### **Master's Dissertation: Compression without Quantization** May 2019 - Aug 2019

University of Cambridge

Supervisors: Marton Havasi, Dr José Miguel Hernández-Lobato

- Developed machine learning-based image compression algorithm.
- Implemented complex machine learning pipeline in Python using Tensorflow.
- Achieved competitive performance with state-of-the-art methods.
- Thesis graded 80.5%.

### **Research Assistant / Google Soli Alpha Developer: Gesture Recognition** June 2016 - Aug 2016

St Andrews HCI Group

Supervisor: Prof. Aaron Quigley

- Implemented a deep neural network to recognize hand gestures using the [Google Soli](#) radar sensor.
- My model recognized 6 different gestures, such as swiping, thumb-sliding and clicking.

- My work has formed the basis for further research in the lab.

## Research Assistant: Categorising Materials with Radar Waves

Jan 2016 - April 2016

St Andrews HCI Group

Supervisor: Dr David Harris-Birtill, Prof. Aaron Quigley

- Developed an ML algorithm to detect the materials in objects using the [Google Soli](#) radar sensor.
- Our system could differentiate more than 20 materials and several different parts of the human body.
- I implemented the ML pipeline in C, C++ and Java using the Weka toolkit.
- We obtained a [patent](#) for our invention and also published work in the [UIST 2016](#).

## LEADERSHIP

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Co-organised the [Learn to Compress & Compress to Learn Workshop](#) at the International Symposium on Information Theory (ISIT) 2025

## INVITED TALKS

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- You Cannot Feed Two Birds with One Score: the Accuracy-Naturalness Tradeoff in Translation. At [HUN-REN AI Symposium 2025](#).
- Data Compression with Relative Entropy Coding. At the *Information Theory Seminar at the Centre for Mathematical Sciences, Cambridge*.
- An Introduction to Relative Entropy Coding and Its Applications. At the *Hungarian Machine Learning Days*.
- Design Space Exploration of Heterogeneous SoCs using Multi-Objective Bayesian Optimization. At *Semiconductor Research Corporation (SRC) TECHCON 2020 (Virtual)*.

## REVIEWING

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**NeurIPS** (2021 – 2024), **ICLR** (2022 – 2024), **ICML** (2021 – 2023), **AISTATS** (2021 – 2023), **TMLR** (2022 – 2025), **UAI** (2024), **ICML Neural Compression Workshop** (2023), **'Learn to Compress' Workshop@ ISIT** (2024), **Foundations and Trends® in Machine Learning** (2024)

## PUBLICATIONS

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- **G. Flamich**, D. Vilar, J. T. Peter, and M. Freitag (2025). You Cannot Feed Two Birds with One Score: the Accuracy-Naturalness Tradeoff in Translation. *Submitted to COLM 2025*
- **G. Flamich**, S. M. Sriramu, and A. B. Wagner (2025). The Redundancy of Non-Singular Channel Simulation. In *ISIT 2025*. Runner-up to the Jack Keil Wolf student paper award (**top 6 student paper**)
- J. He, **G. Flamich**, and J. M. Hernández-Lobato (2024). Getting Free Bits Back from Rotational Symmetries in LLMs.
- J. He, **G. Flamich** and J. M. Hernández-Lobato. Accelerating Relative Entropy Coding with Space Partitioning. In *NeurIPS 2024*.
- **G. Flamich** and L. Wells. Some Notes on the Sample Complexity of Approximate Channel Simulation. In *First 'Learn to Compress' Workshop@ ISIT 2024*. Received **Spotlight award** (top 4 of 16 accepted works).
- D. Goc and **G. Flamich**. On Channel Simulation with Causal Rejection Samplers. In *IEEE International Symposium on Information Theory 2024*.
- J. He<sup>†</sup>, **G. Flamich**<sup>†</sup>, Z. Guo, J. M. Hernández-Lobato. RECOMBINER: Robust and Enhanced Compression with Bayesian Implicit Neural Representations. In *ICLR 2024*.
- Sz. Ujváry, **G. Flamich**, V. Fortuin, J. M. Hernández-Lobato. Estimating optimal PAC-Bayes bounds with Hamiltonian Monte Carlo. In *Mathematics of Modern Machine Learning Workshop at NeurIPS 2023*.

- J. A. Lin, **G. Flamich**, J. M. Hernández-Lobato. Minimal Random Code Learning with Mean-KL Parameterization. In *Neural Compression Workshop at ICML 2023*.
- **G. Flamich**. Greedy Poisson Rejection Sampling. In *NeurIPS 2023*.
- **G. Flamich**<sup>†</sup>, Z. Guo<sup>†</sup>, J. He, Z. Chen, J. M. Hernández-Lobato. Compression with Bayesian Implicit Neural Representations. In *NeurIPS 2023*. Received **Spotlight award** (top 10% of accepted papers, top 2% of submitted papers).
- **G. Flamich**<sup>†</sup>, S. Markou<sup>†</sup>, J. M. Hernández-Lobato. Faster Relative Entropy Coding with Greedy Rejection Coding. In *NeurIPS 2023*.
- **G. Flamich**, L. Theis. Adaptive Greedy Rejection Sampling. In *IEEE International Symposium on Information Theory 2023*.
- **G. Flamich**<sup>†</sup>, S. Markou<sup>†</sup>, J. M. Hernández-Lobato. Fast Relative Entropy Coding with A\* coding. In *ICML 2022*.
- **G. Flamich**<sup>†</sup>, M. Havasi<sup>†</sup>, J. M. Hernández-Lobato. Compressing Images by Encoding Their Latent Representations with Relative Entropy Coding. In *NeurIPS 2020*.
- **G. Flamich**, M. Havasi, J. M. Hernández-Lobato. Compression without Quantization. In *NeurIPS 2019 Workshop on Information Theory and Machine Learning*.
- H.-S. Yeo, **G. Flamich**, P. Schrempf, D. Harris-Birtill, and A. Quigley. RadarCat: Radar categorization for input & interaction. In *Proceedings of the 29th Annual Symposium on User Interface Software and Technology*, pages 833–841. ACM, 2016.

<sup>†</sup> equal contribution.

## TEACHING EXPERIENCE

### Master's Thesis Supervision

University of Cambridge

		Thesis Title
2023	Jiajun He	Compression with Bayesian Implicit Neural Representations <ul style="list-style-type: none"> <li>• <b>published</b> <a href="#">NeurIPS 2023</a> (spotlight award) and <a href="#">ICLR 2024</a></li> </ul>
2023	Szilvia Ujváry	How tight can a PAC-Bayes bound be? <ul style="list-style-type: none"> <li>• <b>published</b> at <a href="#">M3L Workshop @ NeurIPS 2023</a></li> </ul>
2021	Kristopher Miltiadou	Probabilistic Machine Learning

### Undergraduate Supervision

University of Cambridge

2023	Daniel Goc	8 week undergraduate research project <ul style="list-style-type: none"> <li>• <b>published</b> results at <a href="#">IEEE ISIT 2024</a></li> </ul>
2024	Henry Wilson	Currently supervising an 8 week undergraduate research project

### Undergraduate Teaching

University of Cambridge

2024	Supervised* 3 groups of three fourth-year undergraduate students for <i>3F8: Inference</i>
2023	Supervised* 5 groups of two fourth-year undergraduate students for <i>3F8: Inference</i>
2022	Supervised* 2 groups of three fourth-year undergraduate students for <i>3F8: Inference</i>

\* Supervision for undergraduates is a form of small-group teaching at Cambridge and Oxford.

## TECHNICAL SKILLS

### Programming Languages Frameworks & APIs

Python, Javascript, Java, Haskell, Matlab, C, C++,  $\LaTeX$   
Tensorflow, Autograd, SciPy, OpenCV, D3.js, Qt