

Bayes Newsletter

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The journey from undergraduate to PhD: FABIO FEHR



Undergraduate: I was born and raised in Cape Town and did my high schooling in Camps Bay. My first year of tertiary education at the University of Cape Town (UCT) was tumultuous. I didn't know what I liked to study or what I was good at. After my first year I realised that statistics was perfect for me as it was a combination of mathematics (something I liked and was good at) with a wide range of applications and domains.

After my first year I made a leap from Business Science in Economics & Law to a degree in Statistics which was incredibly challenging and discouraged by many. This required more pure mathematics, core computer science and more courses in statistics. Although I struggled and failed a few things on the way it was one of the best decisions I have made.

Honours & Masters: In 2018 I completed my Honours in Statistics and did my research project in Natural Language Processing (NLP). Thereafter, thanks to funding from the South Africa Statistical Association (SASA) and part-time employment from the Statistical Sciences Department as the head-tutor, I was able to afford my Masters in Statistics at UCT. I also worked (and still do work) part time for GetSmarter as tutor in statistics and machine learning. I completed my MSc at UCT at the end of 2020 which gave me a taste for research in machine learning and Nonparametric Bayesian methods.

Internships: During my Honours and Masters holidays I did 3 separate short data science and machine learning internships. These were stimulating and valuable as I realised I was much better suited for academia at that time.

PhD: In February 2021 I started a 4 year PhD program in Switzerland at Ecole Polytechnique Fédérale Lausanne (EPFL) and Idiap Research Institute for artificial intelligence. I am very grateful to be student of this university as it is a world renown technical university. The research institute does cutting edge AI and is based in the beautiful Swiss alps, perfect for hiking and skiing. The main research area is in machine learning and linguistics. This is an active and exciting area of research... just think of online translations and chatGPT!

How is the PhD going?

'How is the PhD going?' is one of the hardest questions you can ask someone in this process. It's hard to gauge when you're in on an unknown path where, when and how to find the end. Overall, I try to keep a positive outlook. I understand that everyones academic journey is different and we need to trust the process.



PhD funding: My research is funded by the Swiss National Centre of Competence in Research (NCCR) in the Evolving Language project. This project brings together researchers from: Linguistics, Computer Science, Social Sciences and Neuroscience. Together, we to solve one of humanity's great mysteries: What is language? - this requires understanding human language processing in the brain, how we pass language down to the next generation, and our capacity for language change in the face of digital communication and neuroengineering.

PhD Project: My role is to build a connection between current state of the art models of language and what we know about the human brain's capacity for the language and learning process. My recent work shows that current language models (much like ChatGPT) can be interpreted as doing a type of posterior inference over their text input. This has a connection to Nonparametric Bayes as the distributions over a text (like a sentence or document) could theoretically be infinite as sentences or documents could theoretically be infinitely long. I was fortunate enough to present this piece of work in Rwanda at ICLR 2023 - which is a prestigious machine learning conference.

Future Research: I have approximately 1.5 year left of my PhD program and plan to spend my time extending the framework to make language models more efficient and connecting language models to other technologies like image generation (think, DALL-E, Stable-Diffusion and MidJourney). I will hopefully do some industry internships as it would allow me to do research with more data and computation power.

Looking forward and looking back

The past: If I look back, I don't think I would change anything. My strange and roundabout path was important to lead me to where I am today. I think the most important thing is to find the intersection of what you like and what you are good at and go for it!

The future: I am not entirely sure where I will go or what I will do next. My PhD has taught me that the more I learn the less I actually knew at the start. I just wish that the next chapter is as exciting as the last. Living in Switzerland has taught me that the world is big with many languages to learn, cultures to understand, and natural beauty to see.