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# Ivar Cashin Eriksson

Dear Georgios Arvanitidis, I am writing to apply for the PhD position in Deep Learning Theory and Differential Geometry. With a Master's degree in data science and applied mathematics, and 6 years of professional experience working with machine learning, I am excited to return to academia. I wish to pursue deep, curiosity-driven research to further my learning and your research topic sounds interesting.

Directly after my studies I continued work at RaySearch Laboratories in Stockholm with whom I had written my Master's thesis. My experience at RaySearch as a Data Science Researcher left a strong, long-lasting impression. I developed ML-based methods for radiotherapy planning of cancer treatment. The work was challenging and rewarding, and involved building custom autoencoders for computer vision. Though I had to leave Stockholm in 2021 to move to Copenhagen, my motivation to return to more research heavy work has only grown stronger.

At RaySearch, and later at Valcon, I worked with autoencoders and probabilistic models to extract structure from complex data like CT scans and financial systems. These projects gave me practical experience with learning useful representations from high-dimensional input, and sparked an interest in how and why such models work. I have since become increasingly curious about the deeper principles behind how machines *learn* and structure in machine learning, and would like to explore these topics more seriously.

I have always enjoyed thinking about machine learning from a theoretical angle, and my favourite courses at university were the ones that focused on the underlying mathematics. Over time, I have realised that I want to understand these systems more deeply, not just build them. That is why I am now looking to return to academia and focus on research questions that explore what gives models their ability to generalise and what role structure plays in that process.

Outside of work, I fill my free time with designing furniture, woodworking, coding, 3D-printing, climbing, road biking, ultimate frisbee, and board games, activities that keep my hands and mind sharp. I thoroughly enjoy picking up new skills and am self taught in all my hobbies. In my professional life, I now want to return to a research environment where I can follow ideas from early exploration to experimentation, refinement, and ultimately publication.

I hope to hear back from you soon. Regards,

Ivar Cashin Eriksson.