Hi Katrina,

I believe that the world of technology and machine learning is not just about codes and algorithms; it's about innovation, problem-solving, and creating a better future. Let me take you on a quick journey through my passion for the field.

I am currently pursuing my Master's in Computer Science with a focus on Artificial Intelligence at the University of Southern California. My academic journey has been a thrilling ride from Nepal to India to the United States, where I have honed my skills in a range of computer science subjects but most importantly….

I have a built a solid understanding of machine learning through my academic and research journey. Since my bachelors at NIT Durgapur to today, I have taken more than 10 courses on AI, ML, NLP and if you look at my transcripts I scored consistent straight As in them. This roots from my deep understanding of the underlying mathematics, curiosity, intuition and a fair amount of hands-on-experience.

As for my research career, I published my first paper 5 years ago and have been consistently devoted since then. Only this year I wrote two papers. The first got accepted at ACL BioNLP conference. We basically built a mental health counsellor you could talk to if you are at mental health risk such as from depression or cyberbullying. We finetuned a large language (similar to GPT and LLaMA) on the data we scraped from reddit and other sources to teach our model how to recognize a person is at such risk and how to help them in a human friendly non invasive but also technical way. Technically, I learned to crack open, improvise upon and finetune LLMs on remote GPUs faster and parallelly during experimentation

The second project was a food image to recipe generation pipeline using computer vision and NLP. Imagine you give me a picture of a salad somewhere from the internet. My deep learning model can give you a shopping list and recipe for it (both in natural language and code- code because maybe in future we could automate cooking using specialized robots). You can even ask it to customize a recipe. Maybe you want it more spicy, with less calories or just need more detailed instruction. We made this possible using GPT and prompting and SOTA such as vision transformer, T5 by google. This paper is under rebuttal and we currently have two strong accepts out of 4. Hoping to turn the last one to our side.

Before my masters, I wrote two papers both of which received awards. At NTU Singapore, I helped an energy research lab to enhance their underwater images taken through their underwater drones. They honored me with their award of excellence for it. I used GANs which is a generative model to do the task. GANs are very interesting. Maybe explain…. In fact GANs led to development of stable diffusion and dalle that took the world by storm.

This all started with my first paper at CSIR where I built an intelligent smoke alarm using classical ML model. The alarm cut down false positive rates by 18% so you don’t have to get up on the chair everytime you cook. We used sensors to detect presence of CO, CO2 and O2. Along with temp measurements, it allowed us to get enough information to detect a fire outbreak effectively. I presented it at my first international conference and got the best paper award out of 100s other papers. This boosted my confidence and motivated me to purse machine learning seriously. No doubt I am loving it and would definitely continue to do so.

I have always loved taking things apart and putting it back together piece by piece. This is exactly what I have pursued through my passion and course projects. We have an API or library for everything today. But that abstracts so many things that I felt this isn’t enough. So I started building these sophisticated techs from scratch. I have built the most foundational DNN called MLP and CNN from sratch using only math. I realized the original inspiration for these architectures in the process.

In summary, I have knowledge on classical ml (reg class), dnn(cnn, rnn, gan), modern models such as transformer and LLM. I know I have a lot to learn but I enjoy doing this and see the learning process as a fun game. I would love to do interesting projects at Volkswagen. Thank you for listening.