8. Describe briefly your personal interests and your interests in autonomous systems.

My self-motivation and passion for AI was supplemented by successfully completing the projects titled "Underwater Communication System for AUV" with "De-noising of Acoustic signals with AI Algorithms". This project aims to enhance underwater communication systems for Autonomous Underwater Vehicles (AUVs) by implementing AI-based de-noising techniques. By leveraging advanced machine learning models tailored for underwater acoustic signal processing, the system distinguishes between desired signals and underwater noise. Integrated into AUV communication systems, the de-noising model enhances signal reliability in real-time, validated through simulations and field trials, promising significant advancements in underwater data exchange.

My predilection to AI landed me in an amazing chance to collaborate with the National Institute of Ocean Technology (NIOT), an autonomous R&D organization under the Ministry of Earth Sciences, Govt. of India, on a project that centered on creating an underwater unmanned aerial vehicle. In this project, neural networks were trained to identify underwater characteristics and marine life from photos that the drone's cameras and sensors recorded. Creating computer vision algorithms to process and interpret the underwater imagery in real-time was one of the project's most difficult yet satisfying tasks. I worked on techniques to enhance image quality in low-light conditions and poor visibility, allowing the drone to effectively navigate and identify objects even in challenging environments. Throughout the project, I collaborated closely with a multidisciplinary team of engineers, marine scientists, and software developers. Together, we integrated our machine learning and computer vision algorithms into the drone's software stack and conducted extensive testing in real-world underwater environments.

I was drawn to the task of training CNN architectures tailored to the unique characteristics of underwater images, including dealing with low-light conditions, varying water turbidity, and distortions caused by refraction. Developing robust V-SLAM algorithms that could handle the dynamic and unpredictable nature of underwater environments was a deeply engaging technical challenge.

Additionally, I found myself immersed in the intricacies of image processing and enhancement techniques, exploring methods to enhance the clarity and contrast of underwater imagery using tools like histogram equalization, adaptive filtering, and image fusion.

Throughout the project, I relished the opportunity to dive into the technical nuances of AI and apply them to real-world problems in underwater exploration. The fusion of machine learning and computer vision technologies in this domain not only fueled my passion for AI but also underscored its immense potential to revolutionize our understanding of the oceans and their ecosystems.

My strong passion for research reaped with accolade when I published a paper on "**A study on Navigation/tracking System Combining GPS and NFC Technologies**", in prestigious **International Journal of Computer Science Trends and Technology (IJCST)** – Volume 10 Issue 3, May-Jun 2022. This research study demonstrates Near Field Communication (NFC) based indoor navigation system which promotes users to navigate through building or complex by enabling a specific location update by touching NFC tags those are spread around and orient users to the destination. Further, this paper initially presents the system requirements and the viability of NFC internal specification with prototype application that directs the future research development.

The study in indoor positioning and navigation techniques and technologies which can maximize positioning has been done considering with following metrics such as NFC, GPS and so on. These metrics are an offshoot of measurement characteristics such as angle, distance and signal strength. While these techniques aid effective positioning, their right application is critical in a system. The indoor navigation-based application of these techniques will determine the degree of accuracy, scalability, complexity and performance of a wireless system.

I understand that it is imperative to pursue in-depth and focused studies which ultimately lead me to the Masters in AI Engineering of Autonomous systems (M.Eng) at Technische Hochschule Ingolstadt. Being one of the top leading university of Germany, focuses on the development of current and future AI systems, enriching the fundamental knowledge and help to master in the diverse and growing requirements of AI systems, how to design, develop, and deploy intelligent systems that can learn, make decisions and operate autonomously, i.e., without human intervention. and being the expertize leader in education in the field of AI with renowned faculties, infrastructure and vibrant study culture ever since founded in 1994, Technische Hochschule Ingolstadt would provide me a holistic perspective on the field of AI with the right learning environment for my specific interests and be the perfect launch pad for my aspirations to become a world class professional to cater the needs of world in the field of Artificial Intelligence.

I am positive that my passion for Artificial Intelligence along with strong background would bolster my pursuits, develop a holistic personality in me and help me realize my goal of serving the humanity as an AI professional.