

Research Statement

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Over the past three years, I have gained a strong foundation in information security through my undergraduate studies. However, I have also developed a keen interest in artificial intelligence and robotics. In addition to completing the required courses for my major, I have taken courses such as Introduction to Artificial Intelligence and Machine Learning and Application, where I have achieved excellent results. Through these courses, I have gained knowledge of cutting-edge technologies, including deep learning, reinforcement learning, and natural language processing.

Furthermore, my strong background in mathematics has given me the analytical skills necessary for success in these fields. During high school, I won several prizes in mathematics contests, and in college, I consistently scored full or near-full marks in all math-related courses. I possess excellent math thinking and computing skills, which have been invaluable in my pursuit of knowledge in these fields. In addition to my coursework, I have gained research experience in a laboratory setting. Through the experience, I have honed my skills in reading and interpreting academic papers.

Research experience

During my sophomore year, I had the opportunity to participate in research at our college's data security joint laboratory. I worked on the "Enclave Storage Engine for Practical Databases" project, which aims to achieve true encrypted storage in the cloud to protect privacy in the era of big data. Through an extensive literature review, I gained knowledge of concepts related to searchable encryption, SGX, and secure data computing.

In my work, I was mainly responsible for debugging the operation of opengauss and implementing data encryption on the client side. Through this experience, I gained valuable insights into the challenges and opportunities in the field of data security. I believe that privacy protection will continue to be a crucial aspect in the rapidly developing field of artificial intelligence, and I am eager to explore this topic further in my research.

During my junior year, I had the opportunity to conduct research at the Institute of Artificial

Intelligence at our university. Specifically, I worked on a project focused on the development of humanoid double-wheeled legs. Through this experience, I gained proficiency in the use of the Robot Operating System (ROS) and further developed my coding skills to effectively operate the robots. I am excited to explore further the intersections of information security, artificial intelligence, and robotics. I believe that my experience in these fields, combined with my dedication to research and willingness to learn, make me a strong candidate for the summer camp at Tsinghua University.

During the summer following my sophomore year, I had the opportunity to intern at China Soft International, where I worked on a project focused on License Plate Occlusion Detection and License Plate Recognition System. As the development manager, I was responsible for implementing and optimizing the model.

In the early stages of the project, I utilized TensorFlow to implement the LeNet neural network. Through further research, I gained a deeper understanding of related technologies such as RNN, LSTM, and CRNN, which I ultimately used to develop a recurrent neural network for detection. Through this project, I acquired a wealth of knowledge related to neural network algorithms.

My experience at China Soft International not only provided me with valuable technical skills but also allowed me to gain hands-on experience in a professional setting. I collaborated with colleagues from diverse backgrounds and developed strong communication and problem-solving skills.

As part of my studies in "Machine Learning and Applications," I completed a project on "Handwritten Digit Generation Based on VAE." I used the PyTorch framework to implement a standard VAE and then used TensorFlow in combination with DCGAN to generate more realistic handwritten digits.

In addition, during the course "Introduction to Artificial Intelligence," I gained a general understanding of various aspects of intelligent technology. At the end of the course, I studied papers related to image super-resolution and learned how to construct technology for enhancing image resolution that produces results closest to the original high-resolution image.

These projects gave me hands-on experience with machine learning and artificial intelligence and helped me further develop my programming skills.

Research interests

My primary interest lies in the field of robotics. During my freshman year, I focused on hardware microelectronics. However, in my sophomore year, my passion for algorithms grew, and I became less interested in traditional software design. Consequently, I switched to information security and learned about cryptography and network attack and defense.

However, with the emergence and power of ChatGPT, I realized that the software era is coming to an end, and even my security major is not immune. It made me recognize that combining software and hardware is what humans and I should excel at. I possess strong coding skills that enable me to quickly implement related applications for physical operations.

Therefore, in my future graduate studies, I intend to focus more on researching fields related to robotics to achieve true success. Robotics research requires a diverse skill set, including knowledge of computer science, electronics, and mechanical engineering. I believe that my interdisciplinary background and passion for robotics would enable me to make significant contributions to the field.

Future research planning

During my senior year of study, I plan to concentrate on the latest advancements in intelligent technology and immerse myself in the literature related to my field of study to gain cutting-edge knowledge. I aim to participate in experiments conducted by relevant research groups to combine my theoretical knowledge with practical application. Additionally, I will continue to improve my thesis writing and English proficiency to ensure that I can publish high-level SCI papers during my master's studies. By doing so, I will enhance my research skills and contribute to the advancement of the field of information security.

Throughout my undergraduate studies, I have developed a passion for intelligent technology and gained valuable scientific research experience and skills. As a result, I have a solid foundation in scientific research. After conducting extensive research and consulting with professional mentors, I discovered that your supervisor's research in this field had had a profound impact, achieved numerous important results, and won several prestigious awards both domestically and internationally. I am impressed by the strong research atmosphere at your institution, and I believe that it can provide me with the opportunity to delve deeper and gain a better understanding of the field.

My plans for the future involve developing my career in Beijing, where I can access abundant practical opportunities to integrate knowledge with practice, gain a better understanding of my profession, and map out my future development direction. If given the chance to attend your summer camp, I am committed to pursuing a doctoral degree after completing my master's degree. I plan to devote myself to a specific field for an extended period, achieve significant academic accomplishments, and contribute significantly to the field.