

Ocean Engineering Statement of Purpose (MS)

It is truly fascinating to witness the meaningful contributions that engineers have made in real-world industry. My desire to be involved in this field drives my pursuit of a Master of Science in Ocean Engineering at Texas A&M University. My primary interests lie in computational hydrodynamics and ocean engineering. I am deeply attracted to your interdisciplinary research in many fields, which matches my interest and previous research background perfectly.

As a young boy, I felt a unique attraction to the ocean and everything about it. This love, combined with my goal of becoming a search engineer, motivated me to enter Huazhong University of Science and Technology (HUST), to study Naval Architecture And Ocean Engineering. During my time as an undergraduate, I obtained a strong foundation through courses in probability and mathematics statistics, fluid mechanics, structural mechanics. My passion and persistence for my major made me a top ranked student during my last three years. My past academic achievements have also demonstrated a strong potential to succeed in graduate studies.

My academic dedication helped me win an exchange opportunity Through Yunlin University of Science and Technology in Taiwan, where I figured out that fluid mechanics is where my research interest lies. During the exchange semester, I was deeply attracted

by the interesting fluid experiments in the open course at Boston University, which enriched my knowledge about applications of fluid mechanics existing everywhere in our daily life. Other coursework, like ship resistance and propulsion, made me realize the importance of fluid mechanics in industry for ocean application and its potential for influence in other social sectors in the future.

After strengthening my theoretical knowledge, my enthusiasm for research drove me to seek a practical project. I started to work as a research assistant in a national Project funded by China Shipbuilding Industry Corporation 719 Research Institute. The project aimed to design and construct a lighter landing impact-testing machine with the same strength. To an undergraduate student, such a realistic engineering problem is a challenge but is also a rare opportunity. I devoted my spare time to literature review and learning FEM analysis and engineering software. After several months of independent work, I completed engineering drawings of all parts of the machine with Auto CAD software and collaborated with a graduate student to perform strength analysis of the structure with ANSYS software. The project at the 719 Research Institute provided me with valuable experiences in optimization, which I would like to apply to my research area of fluid mechanics and hydrodynamics.

During the summer of 2014, I immersed myself in ship design and optimization. With the instruction of Associate Prof. Jiang long SUN (HUST), I independently designed a general arrangement plan for a ship and analyzed its strength, considering hydrodynamic loads and

various complex scenarios. All results and drawings were documented in a research report. Through all these projects, I gained a deep understanding of hydrostatic and hydrodynamic loads on structure, and improved my skills in FEM analysis, engineering graphics, literature review, and scientific writing. With intensive literature review, I further developed a strong interest in applications of fluid mechanics, especially on hydrodynamics and hydro-elasticity.

My passion for theory and engineering applications of hydro-elasticity drives me to keep studying and doing research. I have read more papers in this area, and I believe that fluid-structure interaction (FSI) problems are an exciting research area in engineering. For example, the vortex induced vibrations, and hydrodynamics loads have great influence on the strength and fatigue of off shore structures such as platforms, risers, and wind/tidal turbines. At the same time the flow field changes caused by these newly constructed Off shore buildings would cause ecological issues. Especially with the increasing pollution and exhaustion of fossil fuel, renewable energy sources from the ocean such as deep-sea hydro power extraction, offshore wind energy, wave and tidal current energy are becoming more and more important, so that such offshore energy structures will be developing increasingly in the near future. Together with my past achievements and experiences, and the promising prospects in this field, I am motivated to continue learning and studying fluid mechanics. Meanwhile, there were many unknowns and uncertainties throwing to me in an undergraduate

education, such as theory of FSI, CFD, and other advanced fluid mechanics branches. All above encourage me to continue graduate education and pursue a master degree in ocean engineering.

Your ocean engineering program would be the perfect setting to continue preparing for becoming a professional in ocean engineering research. The past courses and projects equipped me with valuable academic experiences in naval architecture and ocean Engineering and related areas, which make me a competitive candidate for your program. I am thrilled at the opportunity to join your MS program as a highly motivated graduate student eager to engage in a professional community.