

Statement of Purpose

To whom it may concern,

This is Yaolin GE, a final year master student from the major of Maritime Engineering in KTH Royal Institute of Technology, currently applying for the doctoral program in the EU Horizon 2020 MSCA ITN Project FLOWER (Floating Wind Energy Network). I would like to explain as follows my motivation for my application, and my advantages among the potential candidates for your consideration.

Thanks to the swift progress of my bachelor's degree, it is glaring that studying and doing research are endeavors I would like to engage in even more. While studying for my BSc in Naval Architecture and Ocean Engineering at Jiangsu University of Science and Technology, not only did I develop a systematic way of solving existing problems in the marine field, but also I did step forward to pursue research related problems to reflect on. For instance, I was motivated to participate in several undergraduate research projects. One of the most memorable projects I can still recall is the project in which I spent four months to study the offshore wind farm maintenance vessel and its apropos technologies. After this, I did give a presentation on the outcome from my investigation including the past research and current developed technologies of the offshore wind power system such as the mooring systems of floating wind turbines, as well as the outlook of the future trends. It is a rewarding and fruitful experience in which it reshaped my view as a student and also cultivated me a research perspective. I pushed myself hard to explore as much as I can, that dedication brought me a national scholarship and an opportunity to take an exchange study in the UK. That exchange study program at the University of Strathclyde, which I consider did bring great advantages to me from the perspectives of both academic and personal improvements. The courses I have undertaken there covers diverse aspects of naval architecture and marine engineering, of which my favourite ones are Ship Structural Analysis and Seakeeping. Particularly the seakeeping part which mainly investigates the behaviour of marine structures provoked me about the power of both our ocean and mankind's wisdom. For example, how those marine structures behave under different loading conditions, how Morrison's equation can be formulated, in which a series of coefficients need to be sorted out via either numerical ways or experimental ways, and how those theoretical models can be used to predict the response of the semisubmersibles, etc. A bachelor's degree project within the field of vortex-induced vibration was then pursued thanks to the inspiration derived from that experience. I gained a lot from that project in terms of both my research skills as well as personal development. Besides, the study atmosphere there which greatly encouraged independent research and innovative ideas had brought me more confidence in my success in a higher level of study and research abroad.

As a result of the strong interest in exploring at a higher level, I urged myself to learn more under an advanced study environment, for which I then pursued my master's study within Marine Technology at NTNU. The interdisciplinary study and research environment rewarded me a lot in terms of research skills and personal growth. I did follow my passion to polish my understanding in the field of ocean structures. I have taken Advanced Structural Analysis and Hydrodynamic-related courses and from which I gained valuable skills. Namely, I enhanced my numerical analysis skills through several course-related projects such as designing a cruise balcony, which is essentially a stiffened plate structure; analysing the dynamic response of a slender riser using different techniques including mode superposition and frequency response methods; performing FEA static analysis for jacket structures and designing a propeller, etc.

They were quite fun and challengeable in the beginning, for instance, in the project of designing an optimal stiffened plate under the maximum weight constraint, the material property variation under various weather conditions such as ice posed a critical factor for consideration. Moreover, developing a dynamic response model for a slender riser undergoing different wave conditions expanded my horizon to an enormous extent in terms of solving structural problems in a more advanced way. I remember clearly that the riser dynamic response analysis project consumed my entire fall semester to catch the ultimate goal, making an animation. Thankfully, those experiences enhanced my ability to a deeper level to utilize numerical methods to solve practical problems. On the other hand, hydrodynamic-related courses enriched my knowledge in understanding the structural performance when the hydrodynamic load is involved. I feel much more confident about my research and analytical skills thanks to the experience gained at NTNU.

While my spare experiences have been outside the proposed field of study, they demonstrate my work ethic, intellectual curiosity, communication skills, and capacity for both independent and teamwork. Besides, my extracurricular activities support my leadership ability and responsibility. Participated actively in innovative research projects were rewarding and fun, I gained practical problem-solving skills and analytical skills through conducting experiments, carrying out on-site surveys and post-processing activities.

With this wide range of experiences, I have gradually developed a liking taste in maritime industry. Over the last year, I have had some interactions with some Ph.D. students within maritime field at NTNU, and it has given me a tantalizing glimpse into the life of a graduate student – and it is a life I want to lead. It is also a life I believe I am ready and able to manage, as evidenced by my success in my previous graduate coursework and commitment to research. I develop motivation from the level of responsibility and independence required of a graduate student, and relish the opportunity to prove myself at this level. My research and coursework so far have been quite interdisciplinary, spanning the border of naval architecture to marine engineering, and the potential to continue this sort of study is what first attracted me to NTNU. Looking at the work of the professors in the Department of Marine Technology, I was excited to see the breadth of research which covers multi-disciplines and immediately identified several professors whose projects particularly interested me. During the past few weeks, I read papers those professors had recently published, solidifying my interest in offshore structures, which is exactly what I want to discover. Pursuing a Ph.D. degree at NTNU, with the department's diversity of research in marine technology and its strong reputation, will allow me to learn from professors at the top of this new and exciting field. A Ph.D. program will enable me to pursue my research interests to a much greater depth while also expanding my future career opportunities. It is also worth mentioning that joining a community of other like-minded individuals will be a valuable chance for collaboration and personal development. I believe that I am a diligent and highly motivated student and also a well-qualified applicant.

As mentioned at the beginning, I have been aiming to devote myself into the studies and research on offshore structures as a lifelong research goal. To sum up, I expect to contribute to the practical researches with my professional knowledge and practical skills obtained from the Ph.D. career at NTNU. With full confidence in me as well as the professional training you provide in the program, I believe that my plan will be realized any time soon. Thank you very much for your time and consideration.

Applicant: *Yaolin Ge*