Statement of Purpose

During my masters first time I got myself exposed to the dynamic field of research where I learned about how a thought, as an outcome of brainstorming, backed by scientific fundamentals leads to an interesting and motivating outcome. Though I was new to research but was always interested in using simulation softwares and performing those simulations experimentally to verify the simulation output. Later I developed interest in codes used by the simulation softwares to perform any process under restricted conditions effectively and efficiently. Having a mechanical background I always had interest in fluid mechanics and thermal problems. During my course work I learned the basics of computational fluid dynamics and finite element analysis. Meanwhile I came to know about the meshfree methods and its advantages over mesh based methods. The evolution of mesh free methods from late 70's till present from the fields of astrophysics, solid mechanics and fluid mechanics etc. encouraged me to explore this field of research. The benefits of meshfree methods in terms of computational time, easy to implement and accuracy, motivated me to solve two dimensional heat conduction problem at first. The results were compared with the results of mesh based method and found in good agreement. Since heat conduction problem was in Eulerian form, I modelled the bechmark fluid problem in meshfree method that was two dimensional dam break problem which was Lagrangian in nature. The results of dam break problem was compared with the available literature and the modifications suggested in literature attracted my attention towards the improvements in mesh free methods and work currently going on to establish this mesh free method in different fields. I was exicted by seeing the grand challenges of SPH detailed in a literature outlining the five major areas where SPH has to prove its ability authored by Prof. Steven Lind along with other leading researchers in mesh free field. The Arbitrary Lagrangian-Eulerian approach can be used to model cavitation phenomenon leading to erosion.

I would like to pull the attention that I have basic knowledge of SPH and its methodology and this favours my application as an eligible candidate. My thesis work has helped me expand my skill set to explore my fields of interest and develop an understanding of my academic strengths and weaknesses. Although fluid mechanics and thermal engineering are fields that peak my interest, my strength lies in application and abstractions of reality. During my project, I dealt with various operational and tactical issues. The basic aim was to understand a specific problem, model the problem appropriately and find an optimal or reasonably optimal solution. This has helped me to develop a good background in strategic issues pertaining to modelling and operational methodology. I believe that I have the qualities to become a good researcher. I am a creative person and often think contemplatively about various issues of practical importance. Being able to identify patterns and relationships that are not obvious to others is perhaps my greatest strength. This will prove very valuable because an integral part of being a researcher is to perceive the balance between theory and practice, analytical rigor and intuition. My communication skills are good and I like expressing ideas and concepts both in oral and written form over an ideal platform for the dissemination of knowledge in my chosen field of specialization. I would like to reiterate that I possess the background, the ability and the motivation to make a significant contribution. I hope you will take a favourable decision regarding my profile as a Research Scholar and I look forward to join the joint PhD as a successful research scholar under your guidance.