Personal Statement

Ever since my first lectures, I have been fascinated by the elegance of mathematics in real-world applications. Numerical analysis provides particularly powerful techniques for this purpose. Hence my choice for the major field of study, as a result of which I attended several courses, seminars and a programming internship. I finished it with an overall score of 1.1, which was the highest in class.

This passion was also the main reason I started working as a student researcher at the Department for High-Performance Computing of the German Aerospace Center in the field of computational geometry and numerical algorithms. One highlight was the confirmation of participation as a speaker at the ASME Turbomachinery Technical Conference 2018, followed up by the publication of the research work. The title of this conference paper is "Reproducing Existing Nacelle Geometries with the Free-Form Deformation Parametrization". Together with Dr. Siggel and Mr. Becker, we provided a conceptual proof regarding a new parametrization scheme for engine geometries. The most effort was put into an inverse optimization problem, where the solution was found with computational geometry approaches based on B-splines.

Currently, I'm doing my bachelor thesis at the German Aerospace Center under the supervision of Prof. Dr. Schweitzer from the Institute for Numerical Simulation at the University of Bonn. The thesis deals with isogeometric analysis on multiple patches geometries, which is a numerical approach to solve partial differential equations in order to obtain a continuous solution using geometrical methods. This area brings together a lot of fascinating mathematical aspects such as Galerkin approach, computational and differential geometry, and functional analysis. Since the German Aerospace Center is working with the Imperial College on many projects, such as the European PPOSS or the completed ANASTASIA project, I had the pleasure to meet some of Imperial's academic staff. I was highly impressed by their capabilities and I have been desiring to be taught by them since. Moreover, the Imperial College offers the opportunity to focus on numerical analysis and complementary topics with its program. I believe this is an ideal preparation for a professional career as an aerospace scientist. Hence, I would take part in any course on numerical analysis and scientific computing, as well as the two courses on fluid dynamics, which complement my fascination for using applied mathematics in solving real-world problems. In summary, I

believe that this Master's program at Imperial College is the best way to launch my future career as a mathematician in the aerospace industry.

In my spare time, I play violin and participate in some orchestras and other ensembles. I would like to continue to do so in the Imperial College Symphony Orchestra, because music will give me the best chance of acquainting with my course mates. I have also been involved in my university's investment club not only because I am interested in the financial world, but also because working in a student society is a great opportunity to learn from and with students of other institutions and academic backgrounds. Therefore, I would join the Imperial College Investment Club and, of course, the Imperial College Mathematics Society to continue this kind of work.

In my studies, at my work at the German Aerospace Center as well as my spare time, I am heavily engaged in numerical analysis, as this is my main field of interest and greatest passion. The Imperial College offers the opportunity to take part in a world-class course and fully concentrate on applied mathematics with its master's program. Therefore, it would be a great step forward for me to participate in this course.