21st Century COE Program, International COE of Flow Dynamics
Experience Note

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The 21st Century COE International Internship Program brings together excellence in scientific research, international knowledge exchange and a vibrant cultural experience of living and working in Japan. My internship at Tohoku University, Sendai, was over the period from 30th October 2006 to 1st December 2006. During this short time, I was able to work in a world-class University with a wonderful group of people, and enjoy a range of cultural aspects.

I worked as part of the Transdisciplinary Fluid Integration Research Center, Institute of Fluid Science, supervised by Professor Shigeru Obayashi. My research project is entitled "Aerodynamic Inverse Design using Optimization and Data Mining". This work investigates the use of response surface based optimization coupled with a data mining technique in order to improve the computational efficiency of a series of inverse design computations. I applied this work to the design of 2-D airfoil sections. The research deepened my understanding of inverse design, surrogate modeling and data processing. Throughout the project I was given generous support by Professor Obayashi and his staff and students. I intend to continue this work and apply the method to the design of 3-D wings, and it is hoped that the research will culminate in a journal publication.

In addition to carrying out a research project, the COE internship is an opportunity to build links with other Professors, students and researchers. I was fortunate during my placement to be invited to present at the Third ICFD Conference in Matsushima, near Sendai. This was an international conference and was therefore a good occasion for networking with other engineers working in the field of optimization. I also presented my previous work as part of a seminar with all the students from the research group, and listened to many interesting talks from others.

The staff of the COE are very helpful and supportive, and always had time for my questions. I was given a very nice office in which to work, and the University itself is very well situated. The city of Sendai is clean, safe and very beautiful; there are numerous tree lined avenues and parks to enjoy in the 'City of Trees'. The COE and Institute of Fluid Science are located on the Katahira campus, just a short walk to many conveniences such as the shops and restaurants in the shopping mall. Sendai is small enough that it can be easily traversed on foot while the suburbs are also very accessible.

The internship is not simply work motivated, but it provides an opportunity to experience the places and culture in Japan. During my stay, I visited some of the areas surrounding Sendai, including Matsushima, said to be one the three most picturesque places in Japan, the Akui Otaki waterfall, and the mountain temple complex at Yamadera. I have experienced a traditional tea house, the relaxing onsen, and of course the magnificent Japanese cuisine. The serene beauty and neon lights of Tokyo are also not to be missed.

I recommend the COE internship to any scientific researcher wishing to further their career by working abroad. It might seem daunting to work in a foreign country, but the Japanese people are very kind and patient and often go out of their way to help. I didn't speak any Japanese when I first arrived, but you can soon pick up phrases and it is most satisfying when you manage even a short conversation! My stay in Japan was a fantastic intellectual and cultural experience, and one which I will not forget. I would like to extend my thanks to Professor Shigeru Obayashi and Nao Konohara for their support and to all of the Obayashi Lab students for making me feel welcome.

Obayashi Laboratory dinner party in Sendai