

京都大学若手人材海外派遣事業 ジョン万プログラム
研究者派遣プログラム

英文報告書

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1. 渡航者 (日本語)			
氏名	船富 卓哉	採択年度	平成 25 年度
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研究課題名	三次元形状計測による姿勢操作可能な手モデルの構築		
海外渡航期間	平成 26 年 1 月 8 日～ 平成 27 年 1 月 8 日		
渡航先 (英語表記)	国名：the United States of America 大学等研究機関名：Stanford University 研究室名等：Geometric computing group, Computer graphics laboratory 受入研究者名：Leonidas J. Guibas		
2. 渡航の報告 (英文)			
<p>渡航先の研究環境、研究者との交流、研究発表の状況等、渡航中の滞在経験について英語(500～1000語)で記述して下さい。受入研究者と撮影した写真や研究発表で用いた図等について、可能な範囲で別添として提出して下さい。ページ数については増加してもかまいません。</p> <p>この報告は、ジョン万プログラムの成果として、京都大学ホームページ(英文)などに掲載されることがあります。</p>			
<p>First of all, I would like to express my deepest gratitude to Professor Leonidas J. Guibas for his hosting me as a visiting assistant professor in Computer Science Department, Stanford University. Thanks to the support of Young Scholars Overseas Visit Program and Supporting Program for Young Scholars' Home Lab of the John Mung Program, I could have wonderful year in Stanford University. Needless to say, Stanford university is one of top universities in the world. Moreover, Silicon valley, where Stanford university locates, is also one of world-leading areas of innovation and development for both academics and industries in information and communications technology, which is my major. I realize that Computer Science Department in Stanford university has not only full of excellent faculty members and researchers, but also a wonderful environment. I could have chance to attend some workshops held in Stanford university, which are such as "Stanford Computer Forum - Annual Affiliates Meeting" and "Bay Area Vision Meeting", and all of them were fruitful. I could also attend some workshops held by industries.</p> <p>During my stay, I could join the Geometric Computation group, which is headed by Professor Leonidas J. Guibas, in Computer Graphics laboratory. As lab members, there were about five Postdoctoral scholars, about ten doctral students, and three visiting scholars. (Actual number on paper may differ because of laboratory rotation, etc.) All of them are excellent and it was really valuable for me to have a social connection with them.</p> <p>My research project was "Reconstructing articulated shape of human hand and its skeletal structure</p>			

from scanning." This project mainly consists of two topics: reconstructing 3D shape and skeletal structure by observing human hand. With the supposition that the hand consists of 18 rigid parts, we have already proposed a method of reconstructing 3D shape of the rigid parts from scanning data in various postures. During my visit, I mainly focused on analyzing the motion of rigid parts and tried to figure out how we can model the skeletal structure from the observations. Eventually we figured out that it is not sufficiently accurate to assume ball/hinge joints, which is commonly used as a skeleton for manipulating articulated character in computer graphics, for real human hand, and we proposed a method of deriving appropriate constraints of motion in fully 6DOF of 3D rigid transformation. Our new technique requires smaller number of observations and achieved better accuracy. Currently, it has been almost done to prepare for submitting a paper to journal about this technique.

I also tried to learn about "functional map" technique that has been developed in Guibas group. This technique is a novel representation of maps between pairs of shapes that allows for efficient inference and manipulation. They also have been developed a method of adopting this technique to image co-segmentation. I introduced this technique to a professor in Graduate school of Medicine in Kyoto University and we are applying for a grant to have a collaboration to adopt this technique to medical image processing and shape analysis.

Beside research activities, it is also noteworthy that Stanford university also has wonderful support for spouses, partners and families of international students and visiting scholars. The Bechtel international center provides its facility to have many classes and programs for them almost everyday. In their web site (<http://icenter.stanford.edu/families/index.html>), there is a message as follows: "While the scholar will be facing academic and research challenges, each spouse or partner will be facing a somewhat different, but also important, challenge in building and adjusting to a new life here. The following resources can be useful first steps in enriching your time here." Thanks to this great spirits, my family could find many good friends through these classes and programs, and they also enjoyed the visit as well as I did. I realize that such support is really important, and I hope Kyoto university also has good support/environment for families of internatinal students and visiting scholars.