

# 現地レポート／Diego Thomas (School of Multidisciplinary Sciences and department of Informatics)

Destination country : China

Receiving Univ./institute : Microsoft Research Asia

Period of study : From 11/04/2011 to 07/08/2011

DATE OF REPORT : 05/05/2011

## Status of course/research progress

My current research at Microsoft Research Asia (MSRA) is to develop an efficient method for accurate 3D reconstruction of a static scene from a sequence of depth and color images. The finality is to use a kinect device (the Microsoft 3D digital camera) to model a static scene by moving around it. The idea here is first to define an objective cost function to optimize with respect to the batch of depth images and then apply the best-fitted optimization strategy. Thereafter, color images and photometry may be used to improve the quality of the reconstructed model.

## Life situation

I am currently living at the Zijin apartment close to the business center of Beijing, as well as many other interns. The Microsoft building recently moved to the inner center of the business district, in a completely new building. The working conditions are very good and thanks to the many interns the environment is warm and easy to integrate. Beijing is a very interesting city in constant development and with hundreds of places to see and various foods.

DATE OF REPORT : 10/06/2011

## Status of course/research progress

My current research at Microsoft Research Asia (MSRA) is to develop an efficient method for accurate 3D reconstruction of a static scene from a sequence of depth and color images. The finality is to use an in-hand scanning device to model a static scene by moving around it. Each 3D scan is represented in a local coordinate system and we are now focusing on aligning all input 3D scans with each other simultaneously. The idea is that when all depth images are well aligned, the matrix formed by concatenating all depth images becomes of rank 1. The difficulties we are facing now are how to efficiently optimize the transformations starting from an initial guess; and how to handle missing data and occlusions.

## Life situation

I am still living at the Zijin apartment close to the business center of Beijing, as well as many other interns. The working conditions are very good and thanks to the many interns the environment is warm. The numerous possibilities of communicating with other researchers at MSRA are a great opportunity to hit new

ideas and advance my research. Beijing is a very interesting city in constant development and with hundreds of places to see and various foods. Though very difficult to learn, there is a Chinese class at MSRA, which helps for daily life in Beijing.

**DATE OF REPORT : 10/07/2011**

### **Status of course/research progress**

My current research at Microsoft Research Asia (MSRA) is to develop an efficient method for accurate 3D reconstruction of a static scene from a sequence of depth and color images. The objective is to use an in-hand scanning device to model a static scene by moving around it. We developed a method to align the input 3D scans with each other simultaneously by using rank minimization strategy. The idea is that when all depth images are well aligned, the matrix formed by concatenating all depths images becomes of rank 1. We tackled the challenging problem of missing data and occlusions using mask Images and consistency of re-projections. Because of the low computational cost of projection, the speed of our proposed method is promising even for real time application. We are now focusing on experiments using both synthetic and real data.

### **Life situation**

I am still living at the Zijin apartment close to the business center of Beijing, as well as many other interns. Though I still cannot speak Chinese, there are no problems for the daily life in Beijing. The working conditions are still very good and the environment warm.