

## Nens Stipends for Training Stays Report

Project Title: Combining trans-cranial magnetic stimulation (TMS) and eye tracking

Alessio Fracasso

My training at the Laboratory for Social and Neural Systems Research in Zurich was divided into two parts between October and November 2010.

During the first part (from 10/12/2010 till 10/16/2010) I visited the offices and the SNS lab in Zurich, planning the future training to be held on site.

The initial phase was more theoretical and devoted to study which are the most effective stimulation protocols using TMS to influence the eye-movement system.

Next I was shown with all the apparatus in the lab and we defined my subsequent practical training.

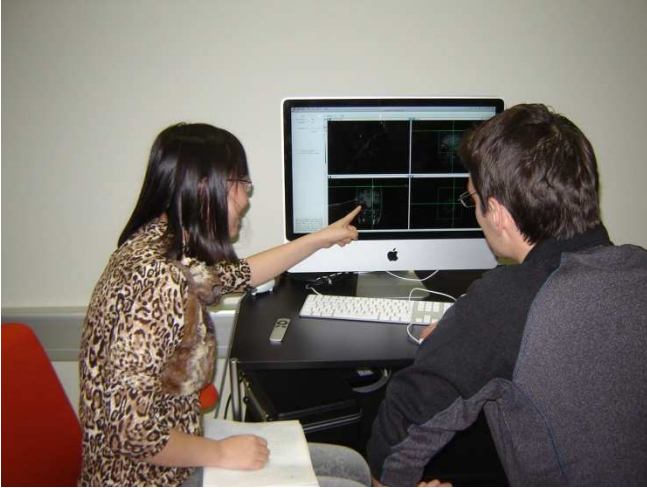
This initial part of my stay culminated with a project presentation of a study that we aim to start here in Zurich after the completion of my training. On this specific project we aim to combine one behavioural paradigm that we developed at my host institution (CiMEC, Trento), together with the TMS and eye tracking systems at SNS labs.

The second part of my training (from 11/24/2010 till 12/9/2010) was definitively more practical and from the first day we started using the TMS localization software at SNS lab. I was in a group with other two students Chaohui Guo and Sunhae Sul currently enrolled as PhD and Post-Doc at the Laboratory for Social and Neural Systems Research, respectively, who needed to be trained as well to conduct their studies using TMS.

Prof. Christian Ruff initially introduced us step-by-step on how to use the Brainsight frameless system to properly define a stimulation site in individual anatomical scan based of various methods, ranging from anatomical localization, coordinates overlay and functional overlay of ROI among the anatomical.

Then using the MRI scanner at SnS labs we obtained our own structural scans and started practicing with the system using our images, with each member of the group being the operator and a second member of the group being the participant, in turns.

On a further phase we put in practice our newly acquired knowledge directly by helping localize regions of interest on a large number of participants (around 30) that, during those days, took part on experiments held at SNS labs. This was extremely useful to familiarize with what we had learnt during the previous days.



**Here I am with Chaohui working on Brainsight**

by implementing the home-developed code at SnS lab together with my own behavioural stimulation code for a psychophysics experiment.

Overall the training has been extremely well organized and useful, both from the theoretical and practical point of view, I really thank NENS for this great opportunity.

I'm looking forward to combine together eye-tracking system and TMS also at CiMEC in Trento.

After localization training we started working on motor thresholds. We localized each other motor hand areas on our own scans and started determining the motor thresholds by visual inspection, both active and at rest. Stimulation was given using Magstim stimulators.

The last phase of my training was to combine the eye tracking device with the TMS stimulator sending a signal from the stimulating computer to both the eye-link and the TMS systems. We did so