

Report of Short Visit to Lille – 23/6/2014 – 25/6/2014

Title: The assessment of residual dysmorphology and distorted animations following surgical repair of cleft lip & palate using 3D dynamic imaging

We visited to the Centre Hospitalier et Universitaire de Lille, France from 23 June 2014 to 25 June 2014. The visit was hosted by Professor Prof Philippe Pellerin of the Centre Hospitalier et Universitaire de Lille. The visit aimed to strengthen collaboration with European colleagues to improve the capacity for continuing research throughout Europe; and to prepare a joint application for European funding under the Horizon 2020. This collaboration would facilitate the submission of a research grant to conduct a multi-centre single cohort control study for the assessment of residual dysmorphology and distorted animations following surgical repair of cleft lip & palate using 3D dynamic imaging (4D imaging).

1. Purpose of the visit

The aim of the visits was to demonstrate the potential application of 4D imaging for the assessment of facial animations of the surgically managed cleft children. The visit would allow the visitors and hosts to share ideas, explore potential difficulties and agree on the details of the proposed methodology to conduct this collaborative study. The following were the detailed objectives of the visit:

- To establish data collection protocol and agree on the mechanism of 4D facial capture.
- Agree on the mechanism of data storage, archiving and sharing among research centers
- Identify potential technical difficulties and ethical issues which need to be addressed before starting the study
- Discuss linguistic, cultural and logistic barriers to allow smooth progression of the study
- Debate the overall structure of the future joint grant application and agree on each party's responsibilities
- Highlight areas of strength to maximize the benefit of the research collaboration and identify areas of weakness that should be addressed. To agree on the overall budget and the detailed administrative support to conduct the proposed collaborative research

2. The work carried out during the visit

Two days meetings were held in Lille to discuss the applications of 4D imaging technique on facial cleft palate. At first Glasgow team introduced 4D facial imaging systems and 4D data analysis to the team at Lille, and then Lille team introduced new approaches of facial shape analysis, cleft repairing and Facial palsy reanimation.

Prof Ashraf Ayoub gave a presentation on 4D imaging to highlight the benefits of applying 4D imaging on facial surgery, Dr Xiangyang Ju presented the most recent dynamic data analysis approaches and Mr. Anas Almukhtar gave a presentation of new approaches on landmarking on volume image and curve analysis.

Prof Philippe Pellerin gave a presentation of clinical applications for 4D facial imaging - secondary rhinocheiloplasty for cleft lip repair sequelae which inspired the team to find more solutions to improve the cleft care. Prof Mohammed Daoudi introduced the approach of facial analysis in Riemannian shape space which was very interesting and exciting. This approach would provide a brown new option to study dynamic facial images. Dr Pierre Guerreschi

introduced his facial palsy reanimation approaches and he was very interested in applying 4D imaging technique for facial palsy studies. Dr Ambre Simon gave a presentation of 2D and 3D prediction of the nose in facial reconstruction.

Further meeting was hold between Glasgow and Lille teams to discuss our further collaboration on 4D imaging and surgical navigation on cleft palate treatments. We agreed to co-apply European funding to support our research collaboration and Lille team are invited to visit Glasgow.

3. The main results obtained

The visit promoted the 4D technique to Lille and we learned the new development of surgical treatment of cleft and facial palsy and new approach of analyzing facial shapes in Riemannian space. This visit strengthened collaboration between Glasgow and Lille on 4D imaging and surgical treatment. We agreed to prepare an application for European funding under the Horizon 2020. Lille team was planning to visit Glasgow.