

ER4**Name:** Louis CUEL**Your credentials:** Doctor in Applied Mathematics**Start day:** 01/01/2015**End day:** 31/03/2016**Involved in WP:** WP5**Hosting Institution:** MIRALab**My Research Training Activity in ITN-DCH****A. Summary of the Career Development Plan:**

During my PhD, my main research topic was the development of robust methods to estimate normals and curvatures on unorganized point clouds and meshes approximating surfaces. This work can be applied in many frameworks such as 3D visualization, 3D reconstruction or 3D mapping. The knowledge of the underlying geometry of a 3D point cloud allows to develop complex, efficient and accurate computer graphics algorithms.

My goal is now to develop applications in the frameworks of “cloth digitization and simulation” and “virtual interaction”. These applications will be useful to reach realistic 3D environments since immersive interactive environments are immature and need more technical research.

B. Core Research Training Activity:

During the 15 months in Project ITN-DCH, I will improve my knowledge of different research topic:

-Motion Capture

One of the specialties of the partner MIRALab is the motion capture. . We are working on a virtual 3D scene including a Christian ceremony in Asinou church in Cyprus. An upcoming secondments in common to both ER4 and ESR13 will be in the partner Cyprus University of Technology during the month of June 2015 in order to acquire intangible data

-3D digitization and processing

MIRALab is specialized in the digitization of 3D objects. We propose an application that allows to protect and promote ancient costumes. In collaboration with our partner “[Dachverband Tanz Deutschland](#)” in Berlin, we are developing a 3D viewer that allows the visualization of real clothes in contextual scenes. A secondment is planned in July in order to reach these objectives.

-Interaction and Tracking

We are developing a program that allows an interaction between a user and a character in real time. This work will be useful to model scene in the church of Asinou (case study 1) where a real user can interact with a 3D virtual character from the church. We work on recognizing gestures and the presence of people.

C. Secondments:

My first two secondments are planned in June in Cyprus and in July in Berlin (see Section B).

D. Dissemination & Outreach:

The Research applications of my work in the framework of cloth simulation may be published in “[International Conference on Computer Vision](#)” or in “[IEEE Transactions on Visualization and Computer Graphics](#)”.

The development of an online-based interactive application that can have linking capabilities has started. The objectives were to display 3D models, as well as huge point cloud and external datas. The result is a solution hosted on the ITN-DCH server:

<http://case-study1.itn-dch.net/>

E. Added Value to my Future Research Career:

My Postdoc position will probably allow me to continue my career in the academic field of computer vision or computer graphics. Both areas require theoretical and applied skills that I learn here. I am also improving my skills related with the research expertise as report and academic papers writing.

Group work and knowledge sharing are also very present expertise in ITN-DCH team. This will help me, especially if I decide to follow a career in companies.