ER3

Name: Georgios Leventis

Credentials: MSc in Cultural Informatics
University of Aegean

Start day: 16/05/2016 **End day:** 15/8/2017

Involved in WP: WP1, WP4, WP5, WP6, WP7 **Hosting Institution:** CUT

Research Training Activity in ITN-DCH

A. Summary of the Career Development Plan:

During my first days as a Marie Curie Fellow, a preliminary Career Development Plan (CDP) has been scheduled in cooperation with my supervisor, where the goals of my planned research along with its outreach/dissemination activities were set. The conducted literature review on applied machine learning techniques in current applications of Cultural Heritage domain regarding the summarization, classification and identification of cultural assets, acted as a driving shaft in shaping the next steps that were needed to be followed. With these requirements in mind, I further examine how different machine learning & deep learning techniques (unsupervised, semi-supervised, supervised) perform in the processing of 3D/4D digital cultural assets that are stored in various digital libraries and repositories. As the classification parameter is considered to be an important factor for these assets, I will study the efforts that are currently being made, aspiring to find new ways of classifying properly the relevant cultural content throughout the time periods. However, in order to achieve the desired scientific results as well as to be deemed successful, the use of certain tasks and methodologies (such as the review and evaluation of current methodologies in Europeana, the creation of deep learning architectures, the 4-dimensional (X, Y, Z, Time) multimedia summarization) is strongly required.

B. Core Research Training Activity

My training is being carried out at my host institution (CUT) through balanced theory and practice in concepts related to a monument and its meaning to peoples' daily life as well as how latest technological advances in Artificial Intelligence (A.I) may contribute significantly in the multidisciplinary domain of Cultural Heritage. The undertaken core research training activity will be strongly enhanced through the participation in forthcoming secondment activities, where further experience will be gained by collaborating with other fellows and partners within ITN-DCH network. Furthermore, as an ER3 with solid background in Neural Networks, my research responsibilities are mainly focused on applying Machine Learning methods in the Cultural domain. Since Deep Learning is considered to be a powerful branch of Machine Learning that is based on a set of algorithms which attempt to model high levels abstractions of data, my training also includes the study and the experimentation with such architectures. In the wider context of my research activity, many publications have already been written, which further contribute in the dissemination of the acquired knowledge to distinguished conferences and scientific books. Moreover, my training activities were enhanced through my participation in documentation processes conducted at Saint-Neophytos Monastery and at Asinou Church (ITN-DCH Case Study), as well as in

numerous outreach activities like the European Researchers' Night 2016 in Nicosia, Cyprus and the Mediterranean Science Festival held in Limassol, Cyprus.

C. **Secondments:**

I have not participated in any secondments yet, but my planned ones will be held in:

1. CNRS
2. FORTH
3. FRAUNHOFER
4. 7REASONS GmbH

D. **Dissemination & Outreach:**

As part of the ITN-DCH training, I will participate in a number of outreach activities, to offer training and research results back to a public forum.

Event Name	Description	Dates
CASA 2016, Geneva, Switzerland	ITN-DCH Meeting and Conference	23/5/2016 – 25/5/2016
CGI 2016, Heraklion, Crete, Greece	Summer School	27/6/2016
CGI 2016, Heraklion, Crete, Greece	Conference	28/6/2016 – 1/7/2016
European Researchers' Night, Nicosia, Cyprus	Active Participation, Organization, Dissemination & Outreach	29/09/2016
EuroMed2016, Nicosia, Cyprus	Conference, Active Participation, Organization & Outreach	31/10/2016 – 5/11/2016
Mediterranean Science Festival, Limassol, Cyprus	Active Participation, Dissemination & Outreach	29/04/2017
ITN-DCH Final Conference, Olimje, Slovenia	Conference, Active Participation, Organization & Outreach	23/5/2017 – 25/5/2017

Also, papers at conference proceedings, and a book chapter as part of Research Outcomes.

Name	Publication	Authors
Towards Monuments' Holistic Digital Documentation: The Saint Neophytos Enkleistriotis Case Study	Progress in Cultural Heritage: Documentation, Preservation, and Protection. 6th International Conference, EuroMed 2016, Nicosia, Cyprus, October 31 - November 5, 2016, Proceedings, Part I. pp. 442–473. Springer International Publishing, 2016	Marinos Ioannides et al.
Educational creative use and reuse of digital cultural heritage data for Cypriot UNESCO monuments	Progress in Cultural Heritage: Documentation, Preservation, and Protection. 6th International Conference, EuroMed 2016, Nicosia, Cyprus, October 31 - November 5, 2016, Proceedings, Part I. pp. 891–901. Springer International Publishing, 2016	Marinos Ioannides et al.

Parian Marble: A Virtual Multimodal Museum Project	Digital Heritage. Progress in Cultural Heritage: Documentation, Preservation, and Protection. 6th International Conference, EuroMed 2016, Nicosia, Cyprus, October 31 - November 5, 2016, Proceedings, Part II. pp. 256–264. Springer International Publishing, 2016	Marinos Ioannides et al.
Immersive Digital Heritage Experience with the Use of Interactive Technology	Progress in Cultural Heritage: Documentation, Preservation, and Protection. 6th International Conference, EuroMed 2016, Nicosia, Cyprus, October 31 - November 5, 2016, Proceedings, Part II. pp. 265–271. Springer International Publishing, 2016	Marinos Ioannides et al.
Mixed Reality and Gamification for Cultural Heritage (Book),	Chapter 6: "3D Digital Libraries and Their Contribution in the Documentation of the Past" Copyright 2017, Publisher Springer International Publishing, Copyright Holder Springer International Publishing AG, DOI 10.1007/978-3-319-49607-8	*Editors* M.Ioannides N.Magnenat-Thalmann G.Papagiannakis

E. Added Value to my Future Research Career:

As a researcher, I aim to exceed my knowledge and improve my skills on Cultural Informatics field by taking advantage of the training I am receiving from CUT and ITN-DCH, as it is a valuable asset to my future research career. My participation at the ITN-DCH, helps me further to acquire my PhD in Cultural Informatics as well as to discover new aspects of technology's interaction with Cultural Heritage. Through my attendance and active participation in multiple workshops and conferences, I have gained additional knowledge, which during my fellowship improved the overall perception I had on the multidisciplinary field of Cultural Heritage along with state-of-the-art documentation procedures that are currently being used. To this end, the collaboration between ITN-DCH fellows and partners in succeeding the common goals of the project, enlarged my field of scientific knowledge as the incoming information affected and pointed my research questions to uncharted directions, leading this way in the discovery of new aspects to apply the innovative technology. Aside from the knowledge and experiences I have gained during this Marie-Curie fellowship, my communication and presentation skills were also improved along with the scientific writing skills by writing various publications and reports.