Matthias T Hernandez – PhD candidate

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Contact Information

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Research Interests

Computer Vision, Computer Graphics, Machine Learning, Deep learning

Education

PhD	**University of Southern California**	Computer Science		2017
MS	**University of Southern California**	Computer Science	(GPA: 3.8)	2014
MS	**Paris Institute of Technology**	Communication Engineering	(GPA: 3.7)	2011
CPGE	**Lycee Pierre de Fermat**	Maths/Physics/Chemistry	(GPA: 4.0)	2008

Research Experience

University of Southern California, Los Angeles, CA — May 2012 – Dec. 2017
Research assistant

3D Face reconstruction and recognition: the goal is to generate facial 3D models from unconstrained videos and use these models for face recognition.

- Design and development of a 3D face tracking and reconstruction software.
- Design of an end-to-end deep learning-based 3D-3D face recognition system.
- Design of an unsupervised deep 3D shape regression technique based on adversarial networks.
- Designing a novel 3D face representation based on autoencoders.

Multimodal registration of 2D-3D retinal images: the aim is to register retinal images across modalities and time to help ophthalmologists track disease growth.

- Developed a vessel segmentation algorithm along with a non-linear 2D-3D registration algorithm. The approach is generic enough to handle 5 different image modalities, including 3D data.
- Developed a disease segmentation module based on supervised-learning.

EURECOM, Sophia Antipolis, France — Sep. 2010 – Mar. 2011
Research assistant

Drowsiness detector: the goal of the project is to detect signs of drowsiness in a driver by monitor the driver with a camera on the dashboard.

- Design and development of a simple head-tracking system to detect a driver's falling asleep.

Industrial Experience

Hewlett-Packard, Palo Alto, CA — Jun. 2015 – Aug. 2015
Multimedia Software Intern

- Design and development of several application softwares on the Sprout machine:
  - 3D modeling of objects with the Sprout sensors: structured light and Intel RealSense. The project involved pointcloud registration and processing.
  - 2D augmented reality app based on the Aurasma system: object tracking and recognition.

Doheny Eye Institute (UCLA) Los Angeles, CA — May 2013 – Aug. 2013
Research engineer intern — May 2014 – Aug. 2014

- Design, implementation, deployment of a novel retinal image registration system to register multiple 2-D and 3-D modalities across time.

Programming Skills

Proficient with the following languages and evironments:
C, C++ (CUDA, openCV), Matlab, Python, CMake, HPC, Pytorch
Some knowledge in the following:
java, PHP/MySQL, HTML/CSS, Caffe, Tensorflow

Relevant Coursework

Computer vision	Deep learning	Machine learning	Artificial intelligence
Biometrics	3-D graphics & Rendering	Optimization	Numerical Analysis
Image compression	Digital Geometry Processing	Robotics	CUDA programming

Publications

- **M Hernandez**, T Hassner, J Choi and G Medioni, "Accurate 3D Face Reconstruction via Prior Constrained Structure-from-Motion", in *Computer & Graphics 2017.*
- D Kim, **M Hernandez**, J Choi and G Medioni, "Deep 3D Face Identification", in *IJCB 2017.*
- **M Hernandez**, J Choi, and G Medioni, "Near laser-scan quality 3-D Face Reconstruction from a Low-Quality Depth Stream", in *Image and Vision Computing, vol. 36, April 2015, pp. 61-69.*
- **M Hernandez**, G Medioni, Z Hu and S Sadda, "Multimodal registration of multiple retinal images based on line structures", in *WACV 2015.*
- Z Hu, G Medioni, **M Hernandez** and S Sadda, "Automated segmentation of geographic atrophy in fundus autofluorescence images using supervised pixel classification", in *Journal of Medical Imaging, Jan. 2015.*
- Z Hu, G Medioni, **M Hernandez** and S Sadda, "Supervised Pixel Classification for Segmenting Geographic Atrophy in Fundus Autofluorescene Images", in *Proc. SPIE Medical Imaging March 2014.*
- Z Hu, G Medioni, **M Hernandez**, A Hariri, X Wu and S Sadda, "Segmentation of the Geographic Atrophy in Spectral-domain Optical Coherence Tomography and Fundus Autofluorescene Images", in *IOVS 2013, vol. 54 no. 13.*
- R Wang*, **M Hernandez***, J Choi and G Medioni, "Accurate 3D Face and Body Modeling from a Single Fixed Kinect", in *3DBST 2013.*
- **M Hernandez**, J Choi and G Medioni, "Laser Scan Quality 3-D Face Modeling Using a Low-Cost Depth Camera", in *EUSIPCO 2012.*

Teaching

Computer Science - 3D Graphics and Rendering

- Fall 2014 – Fall 2015 – Fall 2016 – Fall 2017

Computer Science - Foundations of Artificial Intelligence

- Spring 2015 – Spring 2016

Honors and Awards

- Viterbi School of Engineering PhD fellowship (2012)
- 1st prize Best Masters thesis by the Telecom Foundation (2012):
  Contest video: http://vimeo.com/36964915 *(in French)*
- Elected member of the student Union of Eurecom (2009-2010)
- French baccalauréat with Highest honors (2006)

Languages

French: Native proficiency
English: Fluent
Spanish: Limited working proficiency studied for seven years, several trips to Spain

Extra-Curricular activities

- Active member of the student Union at Eurecom (2009-2010):
  - Responsible for organizing social events for the school: dinners, outings...
- Coursera classes:

Deep learning specialization	Deeplearning.io	2017
Algorithm specialization	Stanford University	2017
Entrepreneurship,	University of Maryland	2014
An Introduction to Marketing	University of Pennsylvania	2013
An Introduction to Corporate Finance	University of Pennsylvania	2013
Project Management	Centrale Lille (France)	2013