europass Curriculum vitae

PERSONAL INFORMATION

Tomás Martínez Cortés

Madrid (Spain)

tmcortes@tsc.uc3m.es

Sex Male | Date of birth 10/05/1985 | Nationality Spanish

PREFERRED JOB

Computer Vision and Data Science

WORK EXPERIENCE

01/09/2010–Present

Research / Project Engineer

Universidad Carlos III Madrid
Av Universidad / 30, 28911 Madrid (Spain)
www.uc3m.es

- Research in computer vision and machine learning
- Commercial product design and implementation
- Distributed and embedded platforms
- Multimedia and communications hardware-software consultant

National funded projects

AFICUS (Architecture for the Future Internet of Users Content) Ref.: TEC2011-26807, Dates(2011-2014)

Design and implementation of an automatic multimedia content annotation system that makes use of: Information Retrieval techniques, video encoding, artificial vision and machine learning.

Besides the research activities I was in charge of: the final software libraries, code integration in the consortium and demonstrator creation.

Public demo is available in:
http://cerceta.tsc.uc3m.es:9090/apps/LabelMe/web/LabelMeDemo.html

NOWCASTING (Now solar radiation foreCASTING) Ref.: IPT-120000-2010-24, Dates(2010-2012)

Creation of a system for short-term solar radiation prediction based on image processing and temporal series models.

Besides of my participation in the research activities I was in charge of the final software libraries and the code integration for the final consortium prototype.

SAMURAI (Saliency and Attention: MUltimodality, context-awaReness, self-Adaptation and bio-Inspiration) Ref.: TEC2014-53390-P, Dates(2015-2017)

Desing a set of multi-purpose computational tools ready to be assembled into different applications such as event detection, object recognition, video annotation and indexing, personalized information retrieval or recommender systems, bio-imaging based diagnosis, healthcare, etc.

European funded projects

TELERESCUER (System for virtual TELEportation of RESCUER) Ref.: RFCR-CT-2014-00002 , Dates(2014-2017)

The aim of the project is to build a teleoperated robot to help in rescue missions, mainly during accidents in coal mines.

I was in charge of the visual system design of the robot that finally includes 5 different cameras (visual and thermal technologies), and both mono and stereo subsystems.

Private funded projects (industrial and security)

CEDEX

Implementation of a machine vision system to automatically control the safety sequences appearing on a display mounted on passengers trains for display certification purposes. The system make use of: computer vision techniques and ad hoc image processing techniques.

I was in charge of designing the visual system to capture the videos, the creation of a computer vision algorithm to perform robust image registrations and the final libraries and code implementation.

OMNIVISION

Design of a color distortion correction algorithm for nocturne traffic cameras. The system includes a video stabilization algorithm, a gamma color correction stage applied following a probabilistic model of the lights, and the creation of the final color rectified video.

My responsibilities were the design and implementation of the complete system and the creation of a demonstrator.

DGT-CMMR (DGT Car Make and Model Recognition)

The project consists on the creation of an automatic system for car make and model recognition using video cameras. The system includes several computer vision techniques as: car detection, image matching, geometrical models, image retrieval.

I was in charge of the final demonstrator creation as well as supporting in the research of the computer vision techniques employed in this project.

ESITUR (INTERACTIVE TOURISTIC SHOWCASES)

The goal of the project is the creation of a system that receives as input the name of a region or city and automatically generates rich multimedia touristic tour guides. It makes use of web scrapping, machine learning and computer vision novel techniques to generate such automatic content.

I was in charge of supervising the development of some modules as well as the final integration of the whole project. I also developed novel city-tuned deep convolutional neural networks that better describe images from each region or city.

ENDESA (INTELLIGENT CAMERA SURVEILLANCE)

The focus of the project was to monitor the temperatures of critical components on an electrical power plant by using thermal cameras. It also included standard visual cameras to detect the creation of turbulence on a near river as a result of the power plant activity, as well as the detection and tracking of a see buoy.

I acted as a consultant visiting the power plant, selecting all the necessary hardware (thermal cameras, lenses, processing boards, etc.) for the complete system as well as developing the blueprints for the deployment of the solution. I also established some guidelines for the necessary computer vision algorithms in the standard visual cameras.

ZOITECH (AUTOMATIC ANALYSIS OF SPERM SAMPLES)

ZoitechLab is a company specialized in building microscopes and solutions for veterinarian solutions and animal reproduction. We build a computer vision system capable of analyzing microscope semen images and detect, segment, and classify each spermatozoon into a set of fixed categories.

I was one of the supervisors of this project were we developed some add-hoc image processing algorithms and deep convolutional networks techniques to perform the automatic analysis.

AZOR

This project consisted in the creation of a portable wireless video arbitrage (VAR) system.

I was in charge of selecting the hardware architecture composed of: cameras, video encoders, WIFI transmitters, routers and display support. I also designed and implemented the software solution for the multiple video stream capture and display, encoding and decoding, video synchronization, video annotation and live replay support.

Currently, the software works under Windows, Mac OS and Linux and there is a company (Labhipermedia) exploiting it commercially.

Private funded projects (health care)

MRI BRAIN TUMOUR CHARACTERIZATION

Development of a Computer-aided diagnosis system for brain tumour classification using MRI imagery. The system includes a software for capturing medical inputs, image processing algorithms to compute ad hoc lesion descriptors and machine learning techniques to create the probabilistic prediction models.

My responsibilities include to acquire enough medical knowledge to close the gap between engineers and doctors, create a graphical software for capture image annotations, design the tumour descriptors based on image content and train the models.

Business or sector Research department, University

01/01/2009–01/01/2010

Trainee / Internship

Electronic Arts Software
Vía de los Poblados / 3, 28033 Madrid (Spain)

- Editing, processing and implementation of audio for videogames
- Designing and development of applications for manage and process information
- Audio quality control

Business or sector Multimedia / videogames

EDUCATION AND TRAINING

01/09/2005–01/01/2010

Telecommunications Engineer

Carlos III University
Av Universidad, 30, 28911 Madrid (Spain)

Academic average grade: 6.9

01/09/2015–01/09/2016

Master in Multimedia and Communications

Carlos III University
Av Universidad, 30, 28911 Madrid (Spain)

Academic average grade: 9.3

23/01/2018–09/05/2018

Explorer entrepreneurship program

Centro Internacional Santander Emprendimiento (CISE), Madrid (Spain)

Design thinking, leadership, business plan, negotiation, communicative skills, marketing, finances, legal startup aspects

PERSONAL SKILLS

Mother tongue(s) Spanish

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

Digital skills

- c, c++, cuda, python.

ADDITIONAL INFORMATION

Publications

- Iván González-Díaz, Tomás Martínez-Cortés, Ascensión Gallardo-Antolín, Fernando Díaz-de-María. Temporal segmentation and keyframe selection methods for user-generated video search-based annotation. In Expert Systems with Applications, 42(1): 488-502 (2015) [Datasets][Online Demo]
- Tomás Martínez Cortés, Miguel Ángel Fernández Torres, Amaya Jiménez Moreno, Iván González

Díaz,Fernando Díaz de María, Juan Adán Guzmán de Villoria, Pilar Fernández. A bayesian model for brain tumor classification using clinical-based features. In IEEE International Conference on Image Processing, 2014

- B. G. Guzman, T. M. Cortés, Á. R. López and A. G. Armada, "Design of a communication, vision and sensory system for a rescuer robot in coal mine areas," *2017 International Conference on Wireless Networks and Mobile Communications (WINCOM)*, Rabat, 2017, pp. 1-5. doi: 10.1109/WINCOM.2017.8238150URL: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8238150&isnumber=8238017
- T. Martínez-Cortés, I. González-Díaz and F. Díaz-de-María, "Automatic Learning of Image Representations Combining Content and Metadata," *2018 25th IEEE International Conference on Image Processing (ICIP)*, Athens, Greece, 2018, pp. 1972-1976.doi: 10.1109/ICIP.2018.8451566,URL: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8451566&isnumber=8451009

Honours and awards

Best academic transcript and final degree project national award "Liberalización de las Telecomunicaciones", 2011 edition. From the Association of Telecommunication Engineers.

Best master student transcript award "Extraordinary Award Graduate", 2016 edition. From the Carlos III University.