Roberto Valle Fernández

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Curriculum Vitae

Education

Technical University of Madrid — **Madrid, Spain**
PhD Programme in Artificial Intelligence — *2015 - 2020*
Thesis: Multi-task shape preserving face alignment.

Rey Juan Carlos University — **Madrid, Spain**
MSc in Computer Vision, 8.83/10 — *2011 - 2013*
Thesis: Text detection and recognition in the wild.

Rey Juan Carlos University — **Madrid, Spain**
MSc in Computer Science and Engineering, 7.91/10 — *2009 - 2011*
Thesis: Vehicle localization, license plate recognition and model identification.

Rey Juan Carlos University — **Madrid, Spain**
BSc in Computer Science, 7.19/10 — *2006 - 2009*
Thesis: Vehicle model recognition.

Internship

University of Nottingham — **Nottingham, England**
Under the supervision of Prof. Georgios Tzimiropoulos — *2019*
Computer Vision Laboratory.

Scientific Publications

Multi-task Head Pose Estimation In-the-Wild
Roberto Valle, José M. Buenaposada, Luis Baumela — *2020*
IEEE Transactions on Pattern Analysis and Machine Intelligence, PAMI 2021.

Cascade of Encoder-Decoder CNNs with Learned Coordinates Regressor for Robust Facial
Roberto Valle, José M. Buenaposada, Luis Baumela — *2019*
Pattern Recognition Letters, PRL 2020, 136, pp. 326-332.

Face Alignment using a 3D Deeply-initialized Ensemble of Regression Trees
Roberto Valle, José M. Buenaposada, Antonio Valdés, Luis Baumela *2019*
Computer Vision and Image Understanding, CVIU 2019, 189.

Facial Landmarks Detection Using a Cascade of Recombinator Networks
Pedro D. López, Roberto Valle, Luis Baumela *2018*
23rd Iberoamerican Congress on Pattern Recognition, CIARP 2018, pp. 575-583, Madrid, Spain, November 19-22. IAPR Best Student Paper Award.

A Deeply-initialized Coarse-to-fine Ensemble of Regression Trees for Face Alignment
Roberto Valle, José M. Buenaposada, Antonio Valdés, Luis Baumela *2018*
European Conference on Computer Vision, ECCV 2018, pp. 609-624, Munich, Germany, September 8-14.

Benchmarking Head Pose Estimation in-the-Wild
Elvira Amador, Roberto Valle, José M. Buenaposada, Luis Baumela *2017*
22nd Iberoamerican Congress on Pattern Recognition, CIARP 2017, pp. 45-52, Valparaíso, Chile, November 7-10.

Head Pose Estimation In-the-Wild Using a Random Forest
Roberto Valle, José M. Buenaposada, Antonio Valdés, Luis Baumela *2016*
9th Conference on Articulated Motion and Deformable Objects, AMDO 2016, pp. 24-33, Palma de Mallorca, Spain, July 13-15.

Patents

Localization of Planar Objects in Images Bearing Repetitive Patterns
Luis Baumela, José M. Buenaposada, Roberto Valle, Miguel A. Orellana, Jorge Remirez *2020*
U.S. Patent 10922582, February 16, 2021.

Teaching Assistant

Reconocimiento de Formas
Prof. Luis Baumela *2017 - 2019*
Spanish.

Deep Learning
Prof. Luis Baumela *2017 - 2019*
English.

Languages

Spanish
Native proficiency

English
First Certificate in English (FCE), Cambridge ESOL

Scholarships Received

Menéndez Pelayo International University **Madrid, Spain**
Intensive English language classes, Intermediate Level 2 *2012 - 2014*
Level B2 related to Common European Framework of Reference for learning languages.

Spanish Ministry of Education Scholarship **Manchester, England**
Language course abroad for a minimum period of 3 weeks *2011*

Research Areas

Technical University of Madrid
Perception for computers and robots group *2013 - 2022*
Collaborator for the PCR group interested in the following areas:

- Computer Vision
- Machine Learning
- Artificial Intelligence
- Deep Learning

Computer Skills

Operating Systems
Linux, Mac OS X, Windows, iOS, Android

Programming Languages
C++, Python, Octave/Matlab

Computer Vision Libraries
OpenCV, Pytorch, Tensorflow, Keras, Caffe, Boost, Scikit-Learn

Geographical Information Systems
ArcGIS, QGIS

Database Management
PostgreSQL, PostGIS

Data Visualization and Analytics
TIBCO Spotfire

Research Projects

HumaneAI microproject WP6, Task 6.10
Using demographic data to manage air quality in a better and inclusive way *2021 - 2021*
European Union's Horizon 2020.

Data for Green Madrid project
Combining privately-held and open data for climate improvement in Madrid *2020 - 2021*
EIT Climate KIC and EIT Digital.

HEIMDAL-UPM project
Detecting semantic data using multiple sensors in-the-wild *2017 - 2019*
Spanish Ministry of Education and Competitiveness.

SPACES-UPM project
Human behaviour supervision using multiple sensors *2014 - 2016*
Spanish Ministry of Education and Competitiveness.

Work Experience

GeoAI Analytics S.L. **Madrid, Spain**
AI department coordinator *2021 - 2022*
GeoAI provides a deep learning-powered geospatial data platform which analyzes satellite-based earth imagery data courtesy of Maxar Technologies© to process, classify, analyze and generate meaningful insight at massive scale, including vehicle detection, automatic classification of defective photovoltaic module cells or automatic agriculture mapping, to name a few.

Telefónica S.A. **Madrid, Spain**

Deep learning and satellite images to estimate the impact of COVID-19 *2020 - 2021*

Motivated by the fact that the Coronavirus Disease (COVID-19) pandemic has caused worldwide turmoil in a short period of time since December 2019, we estimate the negative impact of COVID-19 lockdown in the capital of Spain, Madrid, using commercial satellite imagery courtesy of Maxar Technologies©. The authorities in Spain are adopting all necessary measures, including urban mobility restrictions, to contain the spread of the virus and mitigate its impact on the national economy. These restrictions leave signatures in satellite images that can be automatically detected and classified. Demo: `https://www.youtube.com/watch?v=iJq0BnK9upQ`. In Telefónica, we also participate in the D4GMad project that contributes to "air pollution prevention and control". We build a product that can support city governments around the world to better understand and manage air quality in cities. The uniqueness of D4GMad is that we combine open data with Telefónica's privately-held data, with frequent updates (i.e., daily and real-time data) and hyper-local granularity (i.e., neighborhood and street level), which is crucial to ensure less emissions.

The Graffter S.L. **Madrid, Spain**

Facade building localisation for an augmented reality Android and iOS app *2013 - 2015*

Research and develop on algorithms for localisation of buildings (with repetitive structures) on video streams. The application renders the live camera preview frame on the display to represent a superimposed image over the building. Demo: `https://www.youtube.com/watch?v=hIj3VY6du0k`.

CAB Magazine Online S.L. **Madrid, Spain**

OCR for Spanish ID documents on video *2012*

The goal of the project was to read, in short video streams, the three OCR lines of the Spanish ID documents. OCR lines appears also on other countries passports (our software is valid for this other documents also with minimal customization). In this project we developed a full prototype using C++ and OpenCV on GNU/Linux. Unfortunately the company gave up on the project before the full validation of the prototype so we have the software and the project available to any interested company. Demo: `https://www.youtube.com/watch?v=3CaBmIKTO6Y`.