FERNANDO DE LA CALLE SILOS

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During my years as a researcher I have developed a deep passion for signal processing and machine learning, focusing on diverse areas such as Speech Recognition, Natural Language Processing, Computer Vision and Optimization. I am very passionate to be working on these topics as part of my research at University Carlos III of Madrid and Carnegie Mellon University, and would like to keep doing research on related areas.

EDUCATION

⋄ *Doctor of Philosophy (Ph.D.), Multimedia and Communications.* Universidad Carlos III de Madrid, Spain. *Jun 2013 – Sep 2017.*
PhD thesis: *Bio-motivated Features and Deep Learning for Robust Speech Recognition.*
Funded by AIRBUS Defense and Space Company. My research is focused on improving the performance of the current speech recognition systems in noisy and stressful environments by employing novel signal processing techniques and machine learning algorithms (mainly deep learning).
Cum laude distinction and Ph.D. Outstanding Thesis Award.

⋄ *Master of Science (M.Sc), Multimedia and Communications.* Universidad Carlos III de Madrid, Spain. *Sep 2012 – Jun 2013.*

⋄ *Bachelor of Science (B.Sc), Audiovisual System Engineering.* Universidad Carlos III de Madrid, Spain. *Sep 2008 – Jun 2012.*

ACADEMIC EMPLOYMENT

⋄ **Visiting Researcher** at the Computer Science Department and Electrical and Computer Engineering Department. Carnegie Mellon University. Pittsburgh, USA. *Aug 2015 – Jan 2016.*
Advisor: Prof. Richard Stern. Most of my research at CMU has been concerned with machine learning, robust speech recognition and signal processing.

⋄ **Ph.D. Candidate** at the Multimedia Processing Group in the Signal Theory and Communications Department. Universidad Carlos III de Madrid. *Jun 2013 – Sep 2017.*

⋄ **Researcher** at the Multimedia Processing Group in the Signal Theory and Communications Department. Universidad Carlos III de Madrid. *Sep 2011 – Present.*

RESEARCH ACTIVITIES

Publications in International Journals

⋄ **F. de-la-Calle-Silos** and Richard M. Stern. *'Synchrony-Based Feature Extraction for Robust Automatic Speech Recognition,"* in *IEEE Signal Processing Letters, vol. 24, no. 8, pp. 1158, Aug. 2017*

⋄ **F. de-la-Calle-Silos**, F.J. Valverde-Albacete, A. Gallardo-Antolín, C. Pelaéz-Moreno. *'Morphologically-filtered power-normalized cochleograms as robust, biologically inspired features for ASR,"* in *IEEE/ACM Transactions on Audio, Speech, and Language Processing, vol. 23, no. 11, pp. 2070-2080, Nov. 2015.*

Publications in International Conferences

⋄ **F. de-la-Calle-Silos**, A. Gallardo-Antolín, C. Pelaéz-Moreno. *"An Analysis of Deep Neural Networks in Broad Phonetic Classes for Noisy Speech Recognition",* Advances in Speech and Language Technologies for Iberian Languages. Communications in Computer and Information Science, Springer 2016.

⋄ **F. de-la-Calle-Silos**, F.J. Valverde-Albacete, A. Gallardo-Antolín, C. Pelaéz-Moreno. *'Preliminary experiments on the robustness of biologically motivated features for DNN-based ASR",* 4th International Work Conference on Bioinspired Intelligence (IWOBI 15), June 2015.

⋄ **F. de-la-Calle-Silos**, A. Gallardo-Antolín, C. Pelaéz-Moreno. *"Deep Maxout Networks applied to Noise-Robust Speech Recognition",* Advances in Speech and Language Technologies for Iberian Languages. Communications in Computer and Information Science, Springer 2014.

- ◇ **F. de-la-Calle-Silos**, F.J. Valverde-Albacete, A. Gallardo-Antolín, C. Pelaéz-Moreno. *"ASR Feature Extraction with Morphologically-Filtered Power-Normalized Cochleograms"*, *Anual Conference of the International Speech Communication Association (INTERSPEECH)*, Singapore, *September 2014*.

- ◇ **F. de-la-Calle-Silos**, I. González-Díaz, F. Díaz-de-María. *"Mid-Level Feature Set for Specific Event and Anomaly Detection in Crowded Scenes"*, *IEEE International Conference of Image Processing (ICIP)*, Melbourne, Australia, *September 2013*.

Participation in Research Grants and Contracts

- ◇ *Context-Aware Automatic Speech Recognition under Cognitive Stress aided by Multimodal Biometric Detection (REF.: TD-10)*. Funding entity: Airbus Defense and Space.
- ◇ *Annotation, Indexing and Coding of User Generated Content.* Funding entity: Ministry of Science and Innovation of Spain.
- ◇ *PROSAVE2-Research project in advanced systems for a more eco-efficient aircraft.* Funding entity: European Aeronautic Defence and Space Company (EADS). Participating in developing the tracking algorithm of the aerial refuelling boom system of the Airbus A330 MRTT.
- ◇ *Prospective and algorithms design for video coding.* Funding entity: Procesamiento Digital y Sistemas S.L. (PRODYS).

TEACHING EXPERIENCE

I have been teaching as lecturer at the Department of Signal Theory and Communication, Universidad Carlos III de Madrid, from 2016 in Electrical Engineering subjects such as: Machine learning, Data Processing, Digital Image Processing, Environmental Noise Control, Digital Audio Processing and Algorithmic for Information Retrieval.

COMPLEMENTARY FORMATION

- ◇ 6th Lisbon Machine Learning School. The school covers a range of machine learning topics, from theory to practice, that are important in solving natural language processing problems. *July, 2016*

- ◇ Spanish Thematic Network on Speech Technology (RTTH) Summer Schools. Speech Technology: A Deep Learning Perspective. *July, 2015.* and Speech Technology Evaluation *July, 2013.*

- ◇ Fundamentals of iOS Programming and Advanced iOS Programming bootcamps taught by AGBO. These 2 bootcamps cover 100% of the *"Cocoa Core Competencies"* document by Apple. *September and April, 2012.*

AWARDS

- ◇ Best indexed 2016 JCR journal publication by the Spanish Thematic Network on Speech Technology (RTTH) for the paper *Morphologically-filtered power-normalized cochleograms as robust, biologically inspired features for ASR.*

- ◇ Best poster presentation of the Spanish Thematic Network on Speech Technology (RTTH) Summer School in 2013 and 2015.

- ◇ **Best Academic Record Graduation Award** of class: 2008 - 2012 in the Bachelor of Science of Audiovisual System Engineering. Awarded by the Universidad Carlos III de Madrid, Spain.

ADDITIONAL

- ◇ **Software Skills:** primary Matlab and Python, with working experience in C/C++, Objective-C, Java, iOS and Android app development.

- ◇ **Machine learning:** Experience with state of the art algorithms, currently focus in deep learning. Knowledge of GPU acceleration for machine learning. Experience with Tensorflow and Theano.

- ◇ **Multilingual:** Fluent in English, Spanish as native language.

- ◇ Experience in research collaborations between academia and industry.