Dr. Juan Andrés Morales Cordovilla

PERSONAL DETAILS

Birth	March 31, 1982. Padul (Granada), Spain
Mail, web	juan.morales.edu@gmail.com, juancordovilla.github.io

EDUCATION

2000-06	**MSc. Electronic Engineering** at the University of Granada (UGR), Spain. 3 year of **Physics** ("Quantum Physics", etc.) plus 2 year of specialization. Grade 7.951/10. Master Thesis "Implementation of a Real-Time (RT) Distributed Speech Recognizer over IP (VoIP)" published in conference [5].
2007-11	**PhD. Thesis at the UGR**. "Pitch-based techniques for robust speech recognition" (UGR) [1, 2]. Visits to The Speech and Hearing Research Group, Sheffield University (UK) [6, 7].

EMPLOYMENT AND PROJECTS

2012-14	**Postdoc, TUGraz, Austria**	European project (FP7-ICT-2011-7) on Distant Speech Recognition (DSR) using microphone arrays [8, 9, 10, 11].
2015-16	**Postdoc, INRIA, France**	National project (FUI voiceHome BGD/300-11) on deep Machine Learning (ML) for DSR [12, 13].
2016-19	**Postdoc, UGR, Spain**	Project[1] (TEC2016-80141-P) on Bioinformatics for protein structure prediction [14, 15] [3].
2019-Present	**Teacher, Public School, Spain**	Junta de Andalucía's secondary and Vocational Training (FP) school on subjects for computer System Administration (sysadmin), Maths and Technology [2].

1. I have directly participated in the redaction of this project to get the funding.

2. At the same time I keep the research collaboration with UGR [4].

UNIVERSITY TEACHING EXPERIENCE

- More than 300 hours teaching subjects such as "Digital Signals" or "Audio Technologies" of the Bachelor "Telecommunications Engineering" at the UGR. 2009-17.
- Co-advisor of the students MSc. Florian Iglish (TUGraz 2014), BSc. Siddharth Dalmia (INRIA15) [12] and PhD. student Francisco Gonzalez-Lopez [15] (UGR18).

MERITS

- *Award:* for the best journal student paper [1] (1500 Euros) by the RTTH (Spanish national network on speech technologies). 2011.
- *Challenges:* our speech recognition system [12] was ranked 4 out of 26 participants on the international CHIME3 challenge. 2015.
- *ANECA*: Assistant professor. 2015.
- *Examiner:* of the Pablo C. Molero's PhD. Thesis "Classification and Separation Techniques based on Fundamental Frequency for Speech Enhancement". University of Jaén (Spain). 2016.

- *Reviewer:* of journals (IEEE Signal Processing 2016, Speech Communication16, IEEJ Trans. Journal14) and conferences (ICASSP14 and Interspeech16-17).
- *Competition exams*: for teacher civil servant in Maths (2021) and Computer Science (2023). They are high technical and we only passed the first part around 25%.
- Courses and projects: on Robotics, Bioinformatics, Languages, etc.. (every year).

SKILLS

Related to the IFMIF-DONES project:

- Expert level: MATLAB, C/C++ AND PYTHON (employed in many papers and prototypes, see my web).
- Intermediate: sysadmin in networks and OS (as FP teacher).
- Beginner: FPGA MATLAB HDL CODER, VIVADO XILINX, ALTERA MAX+PLUSII (in my MSc. subjects e.g. "Algorithms Implementation").
- Beginner: SCADA (but advance in RT web speech/graphical based user interfaces).

Software tools (at least at mid-level):

- Hardware: ORCAD-PSPICE, PROTEUS-PCB, TINKERCAD-ARDUINO, etc. (electronic design tools).
- OS: LINUX-BASH, WINDOWS-POWERSHELL, PBS (cluster/grid scheduler).
- Languages: MATLAB (e.g. GPU for ML), C/C++ (concurrent, RT, OOP), PYTHON (theano, pytorch), JAVA (processing), MATHEMATICA, FORTRAN, HASKELL (category theory), LEAN (formal verification), LABVIEW, SCRATCH, VSCODE (IDEs).
- Web and mobile: HTML/CSS, JAVASCRIPT (P5JS), PHP (IoT), and APP INVENTOR.
- Databases: SQL, PHPMYADMIN.
- Networks: optical fiber, routers, Cisco Packet Tracer, XAMMP server, socket, IoT, security, etc.
- Others: GIT(HUB), LaTeX. CHATGPT, WORDPRESS, GOOGLE, LMS (MOODLE, CLASSROOM, FORMS, ..).

Others:

- Languages: Spanish (mother tongue), English (B2 certificate from EOI), German (B1 from EOI), French (begginer).
- Music: guitar, saxophone, singing, etc.

SELECTED PUBLICATIONS

Journals

[1] Juan A. Morales-Cordovilla, Antonio M. Peinado, Victoria Sánchez, and José A. Gonzalez. Feature extraction based on pitch-synchronous averaging for robust speech recognition. *IEEE Transactions on Audio, Speech, and Language Processing. (Best journal paper prize from RTTH)*, 19(3):640–651, 2011.

[2] Juan A. Morales-Cordovilla, Victoria Sánchez, Antonio M. Peinado, and Angel Gómez. On the use of asymmetric windows for robust speech recognition. *Circuits, Systems and Signal Processing (Springer)*, 31(2):727–736, 2012.

[3] Juan A. Morales-Cordovilla, Victoria Sánchez Calle, and Martin Ratajczak. Protein alignment based on higher order conditional random fields for template-based modeling. *PLoS ONE (Public Library of Science)*, 13(6), e0197912, 2018.

[4] Amelia Villegas-Morcillo, Angel M. Gomez, Juan A. Morales-Cordovilla, and Victoria Sanchez. Protein fold recognition from sequences using convolutional and recurrent neural networks. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2020.

Conferences

[5] Juan A. Morales-Cordovilla, Timo Bauman, José L. Pérez, Antonio M. Peinado, and Angel M. Gomez. Implementación de un reconocedor distribuido de voz en tiempo real sobre IP. In *IV Jornadas en Tecnologías del Habla (Iberspeech). Zaragoza*, 2006, Octubre.

[6] Juan A. Morales-Cordovilla, Ning Ma, Victoria Sánchez, José L. Carmona, Antonio M. Peinado, and Jon Barker. A pitch based noise estimation technique for robust speech recognition with missing data. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). Praga*, pages 4808–4811, 2011.

[7] Juan A. Morales-Cordovilla, Pablo Caba nas Molero, Antonio M. Peinado, and Victoria Sánchez. A robust pitch extractor based on DTW lines and CASA with application in noisy speech recognition. In 328:, editor, *Iberspeech. Communications in Computer and Information Science (Springer). Madrid*, pages 197–206, 2012.

[8] Anna K. Fuchs, Juan A. Morales-Cordovilla, and Martin Hagmüller. ASR for electro-laryngeal speech. In *IEEE Automatic Speech Recognition and Understanding Workshop (ASRU). Olomouc*, pages 234–238, 2013.

[9] Juan A. Morales-Cordovilla, Hannes Pessentheiner, Martin Hagmüller, and Gernot Kubin. Room localization for distant speech recognition. In *Interspeech. Singapore*, 2014.

[10] Barbara Schuppler, Martin Hagmüller, Juan A. Morales-Cordovilla, and Hannes Pessentheiner. GRASS: The Graz corpus of read and spontaneous speech. In *The 9th Language Resources and Evaluation Conference (LREC). Reykjavik*, pages 1465–1470, 2014.

[11] Elmar Messner, Hannes Pessentheiner, Juan A. Morales-Cordovilla, and Martin Hagmüller. Adaptive differential microphone arrays used as a front-end for an automatic speech recognition system. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). Brisbane*, pages 2689–2693, 2015.

[12] Sunit Sivasankaran, Aditya A. Nugraha, Emmanuel Vincent, Juan A. Morales-Cordovilla, Siddharth Dalmia, Irina Illina, and Antoine Liutkus. Robust ASR using neural network based speech enhancement and feature simulation. In *IEEE Automatic Speech Recognition and Understanding Workshop (ASRU) (ranked 4/26 at international CHIME3 Challenge). Brisbane*, 2015.

[13] Karan Nathwani, Juan A. Morales-Cordovilla, Sunit Sivasankaran, Irina Illina, and Emmanuel Vincent. An extensive experimental investigation of DNN uncertainty propagation for noise robust ASR. In *Hands-free Speech Communication and Microphone Arrays (HSCMA). San Francisco*, 2017.

[14] Amelia Villegas-Morcillo, Juan A. Morales-Cordovilla, Angel M. Gomez, and Victoria Sanchez. Improved protein residue-residue contact prediction using image denoising methods. In *European Signal Processing Conference (EUSIPCO). Rome*, 2018.

[15] Francisco Gonzalez-Lopez, Juan A. Morales-Cordovilla, Amelia Villegas-Morcillo, Angel M. Gomez, and Victoria Sanchez. End-to-end prediction of protein-protein interaction based on embedding and recurrent neural networks. In *International Workshop on Deep Learning in Bioinformatics, Biomedicine, and Healthcare Informatics (DLB2H) at BIBM*, 2018.