

Roberto Barra Chicote

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Experience

Assistant Professor (Universidad Politécnica de Madrid, Spain) 2009-present

- Co-supervision of PhD students.
- Supervision of several Master Thesis Projects (more information provided at <http://lorien.die.upm.es/~barra/pfcs>).
- Elaboration of National and European projects proposals.
- Coordination of a massive graduate laboratory (200 students) named «*Digital Electronic Systems Laboratory*» from third course in the Telecommunication engineer degree.
- Lecturer in several graduate courses.
- Coordination of the «*Introduction to Affective Computing*» course in the Telecommunication engineer degree.

Visiting Researcher (University of Edinburgh, UK) 2008

My work was focused in the implementation of emotional speech voices using concatenative techniques and Hidden Markov Models based speech synthesis.

Assistant Researcher (Universidad Politécnica de Madrid, Spain) 2006-2009

Involved in several projects related to speech technology.

Visiting Researcher (University of Colorado, USA) 2006

My work was focused in the improvement of acoustic modelling using acoustic variations in long vocabulary spontaneous speech recognition systems.

PhD Granted Student (Universidad Politécnica de Madrid, Spain) 2005-2007

Studies Coordinator (Academia San Miguel) 2004-2009

Manager and teacher of courses (1400 hours) granted by the Spanish Government for unemployed people in the « Plan F.I.P »

Tennis Teacher (R.A.C.E. Sport Club) 2003-2006

Senior coach at initial, advance and pre-competition levels. Coordinator of the kinder area.

Assistant Teacher and System Administrator (Academia San Miguel) 1999-2004

Teacher of basic subjects (linguistics, maths, physics, etc.) to undergraduate students and system manager of the LAN network.

Tennis and Paddle Teacher (Alba-Sport S.L.) 1997-2003

Studies

PhD (Universidad Politécnica de Madrid, Spain) 2006-2011

- Thesis title: «*Contributions to the Analysis, Design and Evaluation of Strategies for Corpus-based Emotional Speech Synthesis* » passed with High Distinction and Honours.
- The contributions of this thesis have been published in six international conference papers and one journal paper, having more than 20 references by other contributions in the field.

Research Sufficiency (Universidad Politécnica de Madrid, Spain) 2004-2006

In the «*Electronic Systems for Intelligent Environments* » program at The Department of Electronic Engineering. This program has quality mention issued by the ANECA (the National Agency for Quality Assessment and Accreditation of Spain)

Advanced Studies Diploma (D.E.A.):

- «*Algorithms and methods for user interfaces based on speech technology*»

Courses:

- Pattern Recognition and Optimization (45 hours), passed with A
- Fundamentals of Speech Technology (30 hours), passed with A
- Automatic Speech Recognition Technologies (30 hours), passed with A
- Introduction to Wavelets: Theory and Applications (30 hours), passed with A
- Biometric Signal Processing in Speaker Identification (30 hours), passed with A
- Embedded and Real Time Systems (30 hours), passed with A
- Human-Machine Interfaces and Dialogue Systems (30 hours), passed with A
- Building Synthetic Voices (20 hours, taught by Ph.D. Alan W. Black), passed with A

Telecommunication Engineer (Universidad Politécnica de Madrid) 1999-2005

Completed Master's Thesis with High Distinction.

- Title: «*Design, Implementation and Evaluation of Strategies to Use Multiple Pronunciations in Automatic Speech Recognition Systems* ». (a paper was published with description and results of the developed system).

Majors in: software communications, electronic and signal processing courses.

This Spanish Degree has been certified as a Master of Science for the US by the ABET (www.abet.org)

Main I+D Projects involved

Title	Duration (months)	Year	Duties and Responsibilities
<i>SIMPLE4ALL "Speech Synthesis That Improves Through Adaptive Learning"</i> (Fp7 European Project)	36	2011	Management and research: <ul style="list-style-type: none">• Manager of the Expressive Speech synthesis technology.• Manager and senior researcher of the Text To Speech systems evaluation architectures.• Manager of the recording studio architecture for the acquisition of HMI corpora and speech databases.• Research and development in <i>Voice Cloning</i> and <i>Voice Reconstructions</i> systems.
<i>Investigación y desarrollo de nuevos algoritmos para la diarización de locutores</i>	12	2010	Senior Researcher: <ul style="list-style-type: none">• Incorporation of new acoustic features for the improvement of speaker diarization systems.• Automatization of a diarization system,

			integrating it into a cluster-based computing architecture.
<i>Study on the prospective of speech-based interfaces for future digital services (for the European Union)</i>	8	2008	Senior consultant on: <ul style="list-style-type: none"> • automatic emotion recognition, • language learning and • expressive speech synthesis.
<i>INAPRA: Advanced Interfaces for Human and Autonomous Robot Interaction</i>	36	2010	Senior researcher: <ul style="list-style-type: none"> • Design, implementation and evaluation of algorithms for the extrapolation and controllability of the emotional strength of synthetic voices. • Implementation of an HMM-based Text To Speech system for Spanish (the system received a prize at http://lorien.die.upm.es/~barra/sintesis-Albayzin08/premio/Mejor_tts_JTH08.jpg)
<i>Tecnología del habla: ROBONAUTA</i>	36	2007	Senior engineer: <ul style="list-style-type: none"> • Integration of concatenative Text Speech synthesizers into the distributed architecture of assistant robots.
<i>Desarrollo de un sistema de traducción de voz a lengua de signos española para un servicio público de atención personal. Subproyecto con la fundacion CNSE: Plan Avanza</i>	15	2007	Senior engineer: <ul style="list-style-type: none"> • Adaptation of the comprehension module to the domain. • Development of visual interface.
<i>Realización de un prototipo de reconocimiento Y comprensión de Habla en el entorno dedicado al control de Vehículos Aéreos No Tripulados</i>	6	2005	Junior engineer: <ul style="list-style-type: none"> • Development of the visual interface and its integration with Human Machine Interfaces (HMI). • Setup of the comprehension and speech recognition modules. • Evaluation of the usability of the system.
<i>ROBINT: Tecnología Del Habla</i>	36	2004	Junior Engineer: <ul style="list-style-type: none"> • Development of automatic emotion recognition systems based on acoustic features. • Development of Voice conversion techniques based on spectral transformation and prosody transformation based on artificial neural networks

Wide description of each project can be provided if required.

Main Publications (as one of the main authors)

Journal Papers (all indexed in the Journal Citation Report)

1. "Lsespeak: a spoken language generator for deaf people", Journal of expert systems with applications, 2012.
2. "Speaker diarization features: the UPM contribution to the RT09 evaluation", IEEE Transactions on Audio, Speech and Language Processing, issn 1558-7916, 2012.
3. "Speaker diarization based on intensity channel contribution", IEEE Transactions on Audio, Speech and Language Processing, issn 1558-7916, 2011.
4. "Analysis of statistical parametric and unit selection speech synthesis systems applied to emotional speech", Speech Communication, issn 0167-6393, 2010.
5. "Increasing robustness, reliability and ergonomics in speech interfaces for aerial control systems", aerospace, issn 1270-9638, 2009.
6. "Speech to Sign Language translation system for Spanish", Speech Communication, issn 0167-6393, 2010.

Conference Papers

1. "Towards an Unsupervised Speaking Style Voice Building Framework: Multi-Style Speaker Diarization", Interspeech, Portland, 2012.
2. "Towards Glottal Source Controllability in Expressive Speech Synthesis", Interspeech, Portland 2012.
3. «Acoustic Emotion Recognition Using Dynamic Bayesian Networks and Multi-Space Distributions», In Proceedings of Interspeech, Brighton 2009.
4. «Generación de una voz sintética en Castellano basada en HSMM para la Evaluación Albayzín 2008: conversión texto a voz», In Proc. of V Jornadas en Tecnología del Habla, 2008.
5. «Aplicación de métodos estadísticos para la traducción de voz a Lengua de Signos. In Proc. of Telecom I+D, 2008.
6. «Spanish Expressive Voices: Corpus for Emotion Research in Spanish», In Proc. of 6th international conference on Language Resources and Evaluation, 2008
7. «In Search of Primary Rubrics for Language Independent Emotional Speech Identification. In Proc. of WISP, 2007.
8. «¿Podrían los ordenadores detectar emociones cuando les hablamos?» In Proc. of Telecom I+D, 2007.
9. «On the limitations of voice conversion techniques in emotion identification tasks». In Proc. of InterSpeech, 2007.
10. «Automatic Phonetic Segmentation of Spanish Emotional Speech» In Proc. of InterSpeech, 2007.
11. «Prosodic and segmental rubrics in emotion identification» In Proc. of International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2006.
12. «A Proposal of Metrics for Detailed Evaluation in Pronunciation Modeling». In Proc. of IV Jornadas en Tecnología del Habla, 2006.

Publications (as a complementary contribution)

References to more than 15 journal and conference papers with other complementary contributions can be provided if required.

International Challenges/Competitions

- Participation with U.P.M. in the *Rich Transcription Evaluation* in Speaker Diarization: 1st European system tied with AMIDA project.
- Participation in *The INTERSPEECH 2009 Emotion Challenge*.
- Participation in *The Albayzin Evaluations* in Text To Speech:
 - Best HMM-based system in 2010.
 - Best system award in 2008.
- Other
 - World Guinness Record: "Most Tennis Balls Held in One Hand", 2012.

Languages

- English (fluent reading, writing and speaking). Experience in oral presentation and scientific publications.
- Spanish (Native).

Knowledge

Programming:

- Proficient in C, C++, MATLAB, OCTAVE, LINUX (COREUTILS), PHP, HTML
- Proficient in R, WEKA, HTK, HTS, GMTK and Festival Toolkits.
- Knowledge of Python, Perl and Java.
- Expertise in web application development.

Operating Systems:

- Wide experience on administration and support of Windows and GNU/Linux.
- Experience in administration of High-throughput computing clusters.

Network:

- Experience in network administration and support.