Miguel Xochicale

Curriculum Vitae – December 2018

Personal Details & Contact

Full name Miguel Angel Pérez Xochicale
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Personal statement

I am a recently qualified Ph.D. in Computer Engineering with 20 years' experience in human-robot interaction, electronics, mechatronics and signal processing. I have 12 years' experience as a lecturer in Mechatronic Engineering and related subjects. I am highly motivated with passion for nonlinear dynamics and deep learning with the ambition to advance AI research and apply such concepts for the benefit of society. Principles of hard and collaborative work, scientific integrity, and human kindness have guided me in all my life decisions.

Education

11/2014 – 11/2018 **Ph.D. in Computer Engineering**, *University of Birmingham*, UK.
Thesis: Nonlinear Analyses to Quantify Movement Variability in Human-Humanoid Interaction.
Supervisors: Professor Chris Baber and Professor Martin Russell
Thesis submission day: 26th October 2018, viva: 11th January 2019

09/2004 – 09/2006 **M.Sc. in Signal Processing**, *National Institute of Astrophysics, Optics and Electronics*, México.
Thesis: Digital Filter FIR with less multipliers
Supervisor: Dr. Gordana Jovanovic Dolecek

08/1999 – 09/2004 **B.Eng. in Electronics**, *Puebla Institute of Technology*, México.
Thesis: Speed control for a two-degrees-of-freedom Robot in LabVIEW.
Supervisor: M.Sc. José Esteban Torres León.

Technical Skills

General GNU/Linux Operating System user (e.g. OpenSuse, Debian and Ubuntu)[2005-present] Single-board computers and microcontrollers (e.g. RaspberryPi, BeagleBone, Arduino and PIC)[2010-present], Inertial Measurement Units (e.g. calibration, collection and data analysis)[2013-present], Graphic design (e.g. Inkscape, GIMP)[2014-present], Web design (e.g. Github pages, Jekyll)[2015-present], and Artificial Neural Networks (e.g. TensorFlow and PyTorch)[2017-present].

Programming R[2013-present], python[2014-present], Robot Operating System (ROS)[2016-present], GNU-Octave (or MatLab)[2009-present], LaTeX[2006-present], C and C++[2015-present], Processing[2012-present], the shell[2010-present], GNU-emacs[2010-present], vim[2016-present], pandoc[2017-present], and open-source enthusiast at GitHub (@mxochicale)[2015-present].

Professional Experience

02/2013 – 08/2013 **Research Assistant in Robotics**, *INAOE's Robotics Laboratory*, México.
Achievements: I developed a Human-Robot Interaction Demo for dancing activities based on a Patrolbot mobile robot and a ZSTAR3 Radio Frequency single three-axial accelerometer. (Documents and code:).

01/2012 – 01/2013 **Lecturer in Mechatronic Engineering**, *Universidad Madero*, Puebla, México.
Achievements: I proposed and supervised the following students' projects: Haptic Referee Glove, Lightmetre and Pychometre using Arduino, Smart Irrigation, Persistent Of Vision Bicycle Wheel and a Delta Robot Structure (Project descriptions and code:). Additionally, I proposed and designed a Mechatronic Laboratory which includes: (i) a benchmark for laboratories in mechatronics in México and Puebla, (ii) a 3D layout design and (iii) minimal requirements of hardware and software for the laboratory (Document, slides and layout:).

09/2003 – 03/2004 **Research Internship in Robotics**, *INAOE*, México.
Achievements: I implemented a speed control for a two-degree-of-freedom robot with microcontrollers PIC 16F84 and 16F877 that made communication via RS-232 using Virtual Instruments on LabVIEW.

Teaching Experience

08/2014–04/2018 **Teaching Associate**, *University of Birmingham*, UK.
(01/2018–04/2018) Engineering Maths 2. Lecturers: Professor Martin Russell, Dr Carl Anthony
(08/2017–12/2017) Engineering Maths 2. Lecturer: Professor Martin Russell
(08/2017–12/2017) Computing for Engineering. Lecturer: Dr Sridhar Pammu
(01/2017–04/2017) Matlab Laboratories. Lecturer: Dr Edward Tarte
(08/2016–12/2016) Computing for Engineering. Lecturer: Dr Sridhar Pammu
(08/2014–12/2014) Small Embedded Systems. Lecturer: Professor Chris Baber

08/2013–12/2013 **Lecturer**, *Bilingual Hight School TECMilenio University*, Puebla, México.
Courses: Information Technology, Euclidian Geometry and Microsoft Office Access

2012 **Lecturer in Mechatronic Engineering**, *Universidad Madero*, Puebla, México.
Courses: Fundamentals of Automation, Industrial Electronics, Research Projects, Metrology, Physics, Computer Integrating Manufacturing, and Power Electronics

2007 – 2012 **Lecturer in Electronic Engineering**, *Universidad Iberoamericana Puebla*, México.
Courses: Stochastic Processes Course, Digital Signal Processing and Analog Filters.

08/2006 – 06/2007 **Lecturer in Mechatronic Engineering**, *Instituto Tecnológico Superior de Atlixco*, México.
Courses: Electronics I, Numerical Methods, and Electricity and Magnetism. (January-June 2007.) Electricity and Magnetism, and Electricity and Industrial Electronics (August-December 2006)

Open Access Publications (OA)

Peer-Reviewed

[OA] Xochicale M and Baber C. *Towards the Analysis of Movement Variability in Human-Humanoid Imitation Activities*. Bielefeld, Germany, October 2017. The 5th International Conference on Human Agent Interaction (HAI2017).

[OA] Xochicale M, Baber C, and Oussalah M. *Analysis of the Movement Variability in Dance Activities using Wearable Sensors*. Segovia, Spain, October 2016. The 2nd International Symposium on Wearable Robotics (WeRob16).

[OA] Xochicale M, Baber C, and Oussalah M. *Understanding Movement Variability of Simplistic Gestures Using an Inertial Sensor*. Oulu, Finland, June 2016. The 5th ACM International Symposium on Pervasive Displays.

[OA] Xochicale M, Baber C, and Oussalah M. *Towards the Quantification of Human-Robot Imitation Using Wearable Inertial Sensors*. Vienna, Austria, March 2017. The 12th Annual Conference on Human-Robot Interaction (HRI2017).

Preprints

[OA] Xochicale M and Baber C. *Strengths and weaknesses of Recurrence Quantification Analysis in the context of human-humanoid interaction*. October 2018. ArXiv e-prints.

Non-Peer Reviewed

[OA] Xochicale M and Baber C. *Quantifying the Inherent Chaos of Human Movement Variability* . Madrid, Spain, June 2018. 15th Experimental Chaos and Complexity Conference (ECCC15).

[OA] Xochicale M and Baber C. *Towards the Analysis of Movement Variability for Facial Expressions with Nonlinear Dynamics*. Glasgow, Scotland, UK, April 2018. The 7th Consortium of European Research on Emotion Conference (CERE2018).

Awards and Honours

11/01/2017 My work "Towards Healthy Ageing with Humanoid Robots" was selected for a talk at the second forum of Mexican Talent, Innovation Match MX 2017,

16-18/06/2016 I won the best poster award at the XIV Symposium of Mexican Students in the UK at University of Edinburgh.

20-24/07/2015 My project of a low-cost robot was selected among 125 applications received from 35 countries and presented at the first international public entrepreneurship program in Mexico (MECATE 2015).

11/2014-11/2018 Ph.D. scholarship by the Mexican National Council on Science and Technology.

25-27/05/2013 Markovito's team won the first place at the Mexican Tournament of Robotics 2013 in the category at HOME where I presented a Human-Robot Interaction Dance Demo.

09/2004-09/2006 M.Sc. scholarship by the Mexican National Council on Science and Technology.

Extra Activities

2013–2018 **Founder of LibrE Robotics**, *a non-profit organization aiming to freely transfer knowledge in Robotics to Mexican children*, GitHub: , Website: .

2017–2018 **Contributor and webmaster of Machine Learning for Mexico**, GitHub: , Website: .

08/2014–06/2018 **Outreach activities and scientific engagement**, *University of Birmingham, UK*.
(05-2018) Finalist at the Three Minute Thesis Competition 2018. Video: and GitHub: .
(2015–2018) Research Poster Conference for (2015) , (2016) , and (2018) . GitHub: .
(2014–2018) Presenting Demos of Human-Robot Interaction at the Undergraduate Open Days. GitHub: .
(2017–2018) Coordinator of the Science Seminars for the Mexican Society. GitHub: , Website: .