Miguel P Xochicale

Curriculum Vitae – March 2018

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Research Interests

I am interested in the fields of Human-Robot Interaction and Human Activity Recognition. Specifically, I am gaining deeper understanding on the automatic quantification of movement variability and time-varying facial expressions using chaos and nonlinear dynamics time series analysis and deep learning.

Education

11/2014 – 11/2018 **Ph.D. in Human-Robot Interaction**, *University of Birmingham*, UK.
Thesis: Automatic Classification of Movement Variability in the context of Human-Robot Interaction
Advisors: Professor Chris Baber and Professor Martin Russell

09/2004 – 09/2006 **M.Sc. in Electronics**, *Instituto Nacional de Astrofísica, Óptica y Electrónica*, México.
Thesis: Digital Filter FIR with less multipliers
Advisor: Gordana Jovanovic Dolecek

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

Publications

MP Xochicale and C Baber. *Quantifying the Inherent Chaos of Human Movement Variability* . Madrid, Spain, June 2018. The 15th Experimental Chaos and Complexity Conference (ECCC2018), (to appear).

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

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

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

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

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

Miguel A Perez-Xochicale and G Jovanovic-Dolecek. *A New Method for Design Narrow Band Lowpass FIR Filters Using a Scale Function.* Veracruz, Mexico, November 2006. The 2nd International Conference on Electronic Design, Proc. edited by Victor Champac at all, ISBN 968-9085-01-8, pp.85-89.

Teaching Experience

01/2018–04/2018 **Teaching Associate**, *University of Birmingham*, UK.
Engineering Maths 2. Lecturer: Professor Martin Russell, Dr Carl Anthony

08/2017–12/2017 **Teaching Associate**, *University of Birmingham*, UK.
Engineering Maths 2. Lecturer: Professor Martin Russell

08/2017–12/2017 **Teaching Associate**, *University of Birmingham*, UK.
Computing for Engineering. Lecturer: Dr Sridhar Pammu

01/2017–06/2017 **Teaching Associate**, *University of Birmingham*, UK.
Matlab Laboratories. Lecturer: Dr Edward Tarte

08/2016–12/2016 **Teaching Associate**, *University of Birmingham*, UK.
Computing for Engineering. Lecturer: Dr Sridhar Pammu

10/2014–12/2014 **Teaching Associate**, *University of Birmingham*, UK.
Small Embedded Systems. Lecturer: Professor Chris Baber

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

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

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

08/2006 – 06/2007 **Invited 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)

Professional Experience

02/2013 – 08/2013 **Research Assistant**, *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. For the demo, I explored four hand gestures where user's worn the accelerometer at his/her left wrist in order to create simple dance activities with the mobile robot.

01/2012 – 01/2013 **Invited Lecturer**, *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. 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.

09/2003 – 03/2004 **Research Internship**, *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.

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 a shared first prize for presenting one of the two best posters 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 Full Ph.D. Scholarship in the UK from the Mexican National Council on Science and Technology (CONACyT).

25-27/05/2013 Markovito's team, based on a Patrolbot mobile robot, 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 Full M.Sc. Scholarship in México from the CONACyT.

Languages

Spanish Native

English Fluent *IETLS Band Score 6.0, January 2014*

Technical Skills

General Inertial Measurement Units (data collection and analysis); Graphic design (Inkscape, GIMP); Artificial Neural Networks (e.g., TensorFlow).

Programming R, python, Robot Operating System (ROS), C, C++, Arduino, Processing, LaTeX, the shell, vim, GNU-emacs, GNU-Octave, MATLAB, LabVIEW, and open-source enthusiast GitHub: github.com/mxochicale

Scientific Engagement

2017–2018 **Webmaster and contributor of Machine Learning for Mexico**, GitHub: , Website: .

2017–2018 **Coordinator of the Science Seminars for the Mexican Society at University of Birmingham, UK**, GitHub: , Website: .

2013–2018 **Founder of LibrE Robotics**, *a non-profit organization, to transfer knowledge of Educative Robotics for children to build conditions for a better world*, GitHub: , Website: .