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Research Interests

I am interested in the fields of Human-Robot Interaction and Human Activity Recognition for which I am intuitively understanding and applying tools from nonlinear dynamics, chaos theory and deep learning to perform automatic quantification of human movement variability.

Education

- 11/2014 – 11/2018 **Ph.D. in Human-Robot Interaction**, *University of Birmingham*, UK.
Thesis: Nonlinear Time-series Analysis for Human-Robot Movement Variability 🐱
Supervisors: 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 📄 🐱
Supervisor: 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. 📄 🐱
Supervisor: José Esteban Torres León.

Publications

Peer-Reviewed

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 📄 🐱.

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 📄 📄 🐱.

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) 📄 📄 🐱.

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) 📄 📄 🐱.








Non-Peer Reviewed

MP Xochicale and C Baber. *Quantifying the Inherent Chaos of Human Movement Variability*. Madrid, Spain, June 2018. The 15th Experimental Chaos and Complexity Conference (ECCC15) 📄 📄 🐱.




MP Xochicale and C Baber. *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) 📄 📄 🐱.

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 **Invited Lecturer**, *Bilingual High School at TECMilenio University*, Puebla, México.
Courses: Information Technology 📄, Euclidian Geometry 📄 and Microsoft Office Access 📄

Spring 2012 – Autumn 2012	Invited Lecturer in Mechatronic Engineering , <i>Universidad Madero</i> , 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 , <i>Universidad Iberoamericana Puebla</i> , México. Courses: Stochastic Processes Course  , Digital Signal Processing  and Analog Filters.
08/2006 – 06/2007	Invited Lecturer in Mechatronic Engineering , <i>Instituto Tecnológico Superior de Atlixco</i> , 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 , <i>INAOE's Robotics Laboratory</i> , 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 , <i>Universidad Madero</i> , 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 , <i>INAOE</i> , 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	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.

Technical Skills

General	Inertial Measurement Units (calibration, collection and data analysis), Graphic design (Inkscape, GIMP), Single-board computers and microcontrollers (RaspberryPi, BeagleBone, Arduino and PIC), and Artificial Neural Networks (e.g., TensorFlow).
Programming	R, python, Robot Operating System, C, C++, Processing, L ^A T _E X, the shell, vim, GNU-emacs, GNU-Octave (or MatLab), and open-source enthusiast at GitHub with my user name @mxochicale.

Scientific Engagement

2017–2018	Contributor and webmaster of Machine Learning for Mexico , GitHub:  , Website:  .
08/2014–06/2018	At 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:  .

Languages

Spanish	Native
English	Fluent