











Personal Details & Contact

Full name Miguel Angel Pérez Xochicale  <http://mxochicale.github.io>
Date of birth 29-09-1981  @_mxochicale
Citizenship Mexican  @mxochicale
Email miguel.xochicale@kcl.ac.uk **ORCID:** 0000-0002-8225-7517




Personal statement

I have passion for Robotics, Chaos, AI, Brains and Open Science. I am currently pushing forward the state-of-the-art of ultrasound-guided procedures by making scientific contributions both to new algorithms, software, hardware and to the design and development of medical devices. I have 21 years' experience in human-robot interaction, electronics, mechatronics and signal processing, along with 13 years' experience as a teaching assistant in computer and robotics engineering.

Education




- 11/2014 – 11/2018 **Ph.D. in Computer Engineering**, *University of Birmingham*, UK.
Thesis: Nonlinear Analysis to Quantify Movement Variability in Human-Humanoid Interaction.
Supervisors: Professor Chris Baber and Professor Martin Russell
Thesis submission: 26/10/2018. Passed Viva: 11/01/2019. Awarded PhD degree: 12/07/2019.
I published the first Open Access and 100% reproducible PhD Thesis since the establishment of University of Birmingham in 1900. Thesis:  Github:  Website: 
- 09/2004 – 09/2006 **M.Sc. in Signal Processing**, *Institute of Astrophysics, Optics and Electronics*, México.
Thesis: Design of digital filters with fewer 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.




Professional Experience




- 04/2019 – present **Research Associate in Software and Hardware Engineering**, *King's College London*.
Achievements: In the context of Ultrasound Needle Tracking, I am developing validation experiments with linear stages under Windows and GNU/Linux OS, designing electronic PCBs and 3D printing holders, characterising ultrasonic transducers, and contributing to real-time tracking software based on Python language via GitHub. As well as contributing to verification and validation of design and development for medical device. All the previous activities in collaboration with an amazing team of renowned clinicians, engineers, QMS specialists and researchers in KCL and UCL. Additionally, I am leading the preparation of two manuscripts.
- 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 (see 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 Psychometre Sensors, Smart Irrigation, Persistent Of Vision Bicycle Wheel and a Delta Robot Structure (see documentation 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 (see documentation 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.




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. *Quantification of Dynamic Facial Expressions with Shannon Entropy in Human-Humanoid Interaction*. London, UK, February 2019. 1st Symposium on Machine Learning and Dynamical Systems (MLDS2019)   .

[OA] Xochicale M. *Quantifying Movement Variability with Nonlinear Dynamics for Human-Humanoid Interaction*. London, UK, June 2019. 25th International Conference on Difference Equations and Applications (ICDEA2019)   .

[OA] Xochicale M. *open-corTeX: A continuous integration framework for open scientific communication*. Cambridge, England (Virtual Conference), Sep 2020. 1st Reproducibility, Replicability and Trust in Science (RRTS20)   .

[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)   .

Teaching and Supervision Experience

01/2020 – present **Supervision**, King's College London, UK.

(04/2020–10/2020) Supervisor of Alex Mitton's master project with the title "Vibro-tactile stimulator for dystonia research" in collaboration with C. Bergeles, V. McClelland and A. Worley

Teaching Associate, King's College London, UK.

(01/2020–04/2020) Medical Robotics. Lecturer: Christos Bergeles

08/2014–04/2018 **Supervision**, University of Birmingham, UK.

(04/2020–10/2020) Co-supervisor of Dinghuang Zhang's master project with the title "Human-Humanoid Tool Collaboration" in collaboration with Chris Baber.

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 **Teaching Associate**, Bilingual High School TECMilenio University, Puebla, México.

Information Technology , Euclidian Geometry  and Microsoft Office Access 

2012 **Teaching Associate in Mechatronic Eng.**, Universidad Madero, México.









Fundamentals of Automation , Industrial Electronics , Research Projects , Metrology , Physics , Computer Integrating Manufacturing, and Power Electronics

- 2007 – 2012 **Teaching Associate in Electronic Eng.**, *Universidad Iberoamericana Puebla*, México.
Stochastic Processes , Digital Signal Processing  and Analog Filters.
- 08/2006 – 06/2007 **Teaching Associate in Mechatronic Eng.**, *Instituto Tecnológico Superior de Atlixco*, México.
(01/2007 - 06/2007) Electronics I, Numerical Methods, and Electricity and Magnetism.
(08/2006 - 12/2006) Electricity and Magnetism, and Electricity and Industrial Electronics
















Technical Skills and Spoken Languages

- General** GNU/Linux Operating System user (e.g. OpenSuse, Debian and Ubuntu)[2005-present] Single-board computers and microcontrollers (e.g. NVIDIA Jetson Nano, RaspberryPi, BeagleBone, Arduino and PIC)[2010-present], Inertial Measurement Units (e.g. calibration, collection and data analysis)[2013-present], Web design (e.g. Github pages, Jekyll)[2015-present], and Graphic design (e.g. Inkscape, GIMP)[2014-present], CAD design (e.g. Autodesk invetor, blender, FreeCAD)[2015-present], Artificial Neural Networks (e.g. TensorFlow and PyTorch)[2017-present], and 3D printing (e.g., flsun, cura) [2019-present].
- Programming** Python[2014-present], R[2013-present], Robot Operating System (ROS)[2016-present], GNU-Octave (or MatLab)[2009-present], L^AT_EX[2006-present], C and C++[2015-present], Processing[2012-present], the shell[2010-present], GNU-emacs[2010-present], vim[2016-present], pandoc[2017-present], open-source enthusiast at GitHub (@mxochicale)[2015-present], and continuous integration and continuous delivery [2019-present].
- Languages** Spanish[Native], English[Fluent], Chinese[Beginner]

Grants, Awards and Honours

- 14/04/2020 - 9/06/2020 King's Health Partners grant for the project "Sensory system abnormalities in childhood dystonia" lead by Verity McClelland and in collaboration with Carlos Seneci 
- 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

- 04-2019 – present **Outreach activities and scientific engagement**, *King's College London, UK*.
(02-2020 – 06-2020) Alexandra Lautarescu and I are organising the Reproducible, Interpretable, Open, & Transparent Science Club at St Thomas' Hospital
(20-08-2019) In2ScienceUK: sharing my scientific journey to young scientist on how they can become better scientist.
(09-2019) New Scientist Live: showcasing software segmentation that helps doctors to create 3D models of brain tumors using AI.
- 2013 – present **Founder of LibrE Robotics**, a non-profit organization aiming to freely transfer knowledge in Robotics to Mexican children, GitHub: , Website: .
- (2019–present) Artificial Intelligence and Robotics for Children (air4children) GitHub:  Slides: 
- 2017 – 2018 **Developer 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: .