

# CURRICULUM VITAE: Felipe Ortiz-Huerta

## 1. Personal Information

**Name:** Felipe Ortiz-Huerta

**Date of Birth:** August 31, 1982, Ensenada, Baja California, México.

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## 2. Summary

I am a Research Scientist with 7+ years of academic research experience in quantum photonics (theoretical and experimental) and 1.5+ years in Machine Learning applications for quantum optics research. Excellent problem-solving skills and ability to perform well in a team. I currently implement practical solutions, using **AI and Machine Learning** algorithms, to increase the revenue of small and medium Enterprises through **algorithmic marketing** (churn prevention, geospatial analysis) and **algorithmic inventory** (forecasting with statistical and Machine Learning methods).

## 3. Professional Experience

### Current Appointments:

-Full time Data Scientist at Magna-Machina. (October 2022-Current)

-Part-time teacher. Courses given: Integral Calculus, Programming with Matlab and Numerical Analysis, at State University of Baja California (UABC) in Ensenada, Baja California. (2021-current)

- Data Scientist and Machine Learning Engineer freelance consultant. Officially registered at Servicio de Administración Tributaria (SAT). RFC: 820831A8A. (December 2018- Current).

## Previous Appointments:

- Post-doctoral Researcher in “*Analytical and numerical design of hybrid microcavities for single photon sources experimentally characterized*” at CICESE. October 2021- October 2022.
- Post-doctoral Researcher in “*Microcavities applications for quantum information and quantum computation*” at CICESE. October 2020 – July 2021.
- Thesis committee member for Optics student at CICESE. (2021- 2022)
- Collaboration in CONACTY Project “Frontier Science 2020”. Project title: Quantum control of light-matter interactions. 2020-2021.
- Technical trainer at the University of Bristol: I trained researchers in the School of Physics in the operation of a specific piece of equipment (home-built confocal microscope and Photonic Professional, Nanoscribe GmbH ). 1<sup>st</sup> of March 2018- 30<sup>th</sup> April 2018.
- High-school Teacher at the Centre for Technical and Higher Education (CETYS University) in Ensenada, Baja California, México: Physics (Classical Mechanics, Electricity and Magnetism); Integral & Differential Calculus, Algebra, Geometry & Trigonometry. September 2009-June 2012.
- Group Counselor (Supervising academic development of the students and talking to their respective parents at CETYS University). September 2009-June 2012.

## 4. Professional Certificates

- [edX Verified Certificate](#) for “*Machine Learning with Python-From Linear Models to Deep Learning*”, from Massachusetts Institute of Technology (MIT). Issued December 2021

## 5. Academic Qualifications

**Doctorate:** PhD awarded by the Faculty of Engineering, Department of Electrical and Electronic Engineering, University of Bristol, Quantum Engineering Labs (QET Labs).

Link: <http://www.bristol.ac.uk/qet-labs/>.

PhD thesis title: *Fabrication and optimization of hybrid Fabry-Perot microcavities for single-photon sources*.

Admission: September 2013.

Graduation: May 2018.

Supervisor: Professor John G. Rarity.

**MSc:** Optics with orientation on Optoelectronics, Department of Applied Physics, Scientific

Research Center and Higher Education of Ensenada, Baja California Mexico (CICESE).

Link: <https://www.cicese.edu.mx/investigacion/optica/1>.

Admission: September 2005.

Graduation: April 2008.

MSc thesis title: *Adaptive Interferometer with a photorefractive CdTe Crystal*.

Supervisor: Professor Anatoly Khomenko.

**University:** Electrical and Electronic Engineering, Faculty of Engineering, State University of Baja California (UABC), Ensenada Baja California, Mexico.

Admission: August 2000.

Graduation: December 2004.

## 6. Projects:

- **Clustering Analysis:** I realized a cluster analysis of the customers of a cleaning products company to segment their customers according to their buying frequency and quantity to help measure the loyalty of their customers and transfer this info to their marketing team. ([Click here for more info](#)).
- **Geospatial Analysis:** I realized a geospatial analysis of the customers of a cleaning products company converting the address to a geospatial location with google maps API and present the location with an interactive folium map. This analysis gave them the insights of their customers to make informed decisions about their potential business expansion. ([Click here for more info](#)).
- **Churn Prevention:** I developed a predictive algorithm to analyze Villahi customers and calculate their churn probability. trained algorithm (Random Forest classification algorithm). ([Click here for more info](#)).
- **Forecasting and Optimization of Inventory:** I deployed a demo web-app that forecasts a product's yearly demand and uses the EOQ (Economic Order Quantity) Model to calculate how much of that product should be ordered and when it should be ordered. ([Click here for web-app demo](#)).

## 7. Publications:

### Journals:

1) Ortiz-Huerta, F., & Garay-Palmett, K. (2022). [Analytical and numerical design of a hybrid Fabry–Perot plano-concave microcavity for hexagonal boron nitride](#). Beilstein Journal of Nanotechnology, 13(1), 1030-1037.

2) F. Ortiz-Huerta, L. Chen, M. Taverne, J. P. Hadden, M. Johnson, Y. L. D. Ho, and J. G. Rarity, "[Fabrication of hybrid Fabry-Pérot microcavity using two-photon lithography for single-photon sources](#)", *Opt. Express* 26, 33245-33252 (2018)

3) Knauer S, Ortiz-Huerta F, Lopez-Garcia M & Rarity J.G, 2017, '[Polymer photonic microstructures for quantum applications and sensing](#)'. *Optical and Quantum Electronics*, vol 49.

### **Conference talks:**

4) F. Ortiz-Huerta, "Fabrication of hybrid Fabry-Pérot microcavity using two-photon lithography for single-photon sources". Invited talk at the Scientific Research Center and Higher Education of Ensenada (CICESE) held 3<sup>rd</sup> of December 2018, Ensenada, Baja California, México.

5) F. Ortiz-Huerta, "Why and how to construct a quantum computer". Invited talk at "Technological Institute of Ensenada" held 6<sup>th</sup> of September of 2018, Ensenada, Baja California, México.

6) Huerta, FO, 2016, 'Progress towards a spin photon interface'. In Photon 16: held 5-8 September 2016, University of Leeds, UK.

7) Knauer S, Ortiz-Huerta F, Lopez-Garcia M & Rarity J.G, 2016, 'Polymer photonic microstructures for quantum applications and sensing'. in: 2016 International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD 2016): Proceedings of a meeting held 11-15 July 2016, Sydney, Australia. Institute of Electrical and Electronics Engineers (IEEE), pp. 99-100.

### **Poster presentations**

8) F. Ortiz-Huerta, L.Chen, M. Taverne, J.P. Hadden, D. Ho, M. Johnson and J.G. Rarity, "Fabrication of Hybrid Fabry-Perot Microcavities for Single-Photon Sources" in Student Chapter OSA-SPIE-CICESE Meeting: held 25-27 September 2018, CICESE, Ensenada, Baja California, Mexico.

9) F. Ortiz-Huerta, L.Chen, M. Taverne, J.P. Hadden, D. Ho, M. Johnson and J.G. Rarity, "Fabrication of Hybrid Fabry-Perot Microcavities for Single-Photon Sources" in Bristol Quantum Engineering Technologies (BQIT) Meeting: held 18-20 April 2018, University of Bristol, UK.

10) F. Ortiz-Huerta, S. Knauer, M.Taverne, L. Chen, D. Ho and J.G. Rarity, "Optimization of Optical Microcavities for Single-Photon Sources" in Single-Photons Single-Spins (SPSS) Meeting: held 12-13 September 2016, University of Oxford, UK.

## 8. Skills

- I currently use **Python** for my Machine Learning projects. Dataframes manipulation with **Pandas**, Machine Learning modelling and Time-Series Forecasting with **Scikit-learn** and **Tensorflow**, **PostgreSQL** for relational databases, **Streamlit** for Web Apps, **Matlab** for Scientific computing and **Lumerical** for Finite Difference Time-Domain simulations.

-VFX video content creator: Adobe **After Effects** [composite videos](#) and **Blender** 3D models.

## 9. Special Awards, Honours and Distinctions

- Member of the National System of Researchers in Mexico (SNI). (2021-current)
- Full-time scholarship award from CONACYT (National Council of Science and Technology of México) for PhD studies at the University of Bristol (2013-2017).
- Honorary mention as best poster presentation at Bristol Quantum Engineering Technologies (BQIT) Meeting: held 18-20 April 2018, University of Bristol, UK.
- 3<sup>rd</sup> place as best poster presentation at Student Chapter OSA-SPIE-CICESE Meeting: held 25-27 September 2018 at CIC3SE, Ensenada, Baja California, Mexico.
- Official acknowledgement as outstanding counseling given at students at CETYS Universidad in Ensenada, Baja California, Mexico (June 2012)

## 10.Languages

-Spanish (mother tongue), English -Exam TOEFL (iBT) 101 points.

## 11.Hobbies

- Gym
- Dancing.
- Film and history buff.