

# Lucas Camponogara Viera

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Currently working with design and simulation of Josephson junction-based superconducting circuits as a roadmap for large-scale fault-tolerant Quantum Computing in the NISQ era. My research interests are mainly in the field of circuit Quantum Electrodynamics and quantum-classical Machine Learning. Notwithstanding, I am always keen to learn about related engineering and technology trends straddling multiple disciplines to enhance research skills and sharpen communication. My work experience includes machine learning applied to image processing (deblurring, denoising), computer vision (classification), and natural language processing (sentiment analysis), as well as software development for Bluetooth communication.

## Education

### National Taiwan Normal University - NTNU

Taipei, Taiwan

2020 – 2023 (Exp.)

- **PHD DEGREE** IN ELECTRO-OPTICAL ENGINEERING, FOCUS ON QUANTUM COMPUTING
- **SUBJECT:** DESIGN OF TRANSMON-BASED PROCESSORS FOR SUPERCONDUCTING QUANTUM COMPUTING

### Federal University of Santa Maria - UFSM

Santa Maria, RS, Brazil

2017 – 2018

- **B.SC. DEGREE** IN CONTROL AND AUTOMATION ENGINEERING (INCOMPLETE)
- COMPLETED 180 CREDITS OF COMPLEMENTARY COURSEWORK IN COMPUTER SCIENCE (MACHINE/DEEP LEARNING)
- **AVG:** 8.04/10

### Federal University of Santa Maria - UFSM

Santa Maria, RS, Brazil

2015 – 2017

- **M.SC. DEGREE** IN PHYSICS, FOCUS ON QUANTUM INFORMATION
- **THESIS:** DISTRIBUTION AND QUANTUM COHERENCE MANIPULATION IN MULTI-QUDIT SYSTEMS
- **AVG:** 7.7/10

### Federal University of Santa Maria - UFSM

Santa Maria, RS, Brazil

2011 – 2015

- **B.SC. DEGREE** IN PHYSICS, FOCUS ON QUANTUM ELECTRODYNAMICS
- **THESIS:** DIMENSIONAL ASPECTS OF PHOTON MASS IN QUANTUM ELECTRODYNAMICS
- **AVG:** 7.59/10

## Professional Experience

### Research And Development Intern

**INSTITUTION:** NATIONAL TAIWAN NORMAL UNIVERSITY (NTNU) - TAIPEI, TAIWAN

Taipei, Taiwan, Sept. 2019 – Feb. 2020

- **Subject:** The internship consisted of the development of a Generative Adversarial Network (GAN) with Python, Keras and TensorFlow for the purpose of image deblurring.

### Software Engineer

**COMPANY:** NATIONAL INSTITUTE OF SPATIAL RESEARCH (INPE) - SANTA MARIA, RS, BRAZIL

Brazil, July 2017 – January 2019

- **Subject:** The project consisted of the development of a GUI based automation software in python for research data acquisition through a secure Bluetooth Communication Client-Server Channel.

## Awards

### RoboWeek Challenge

Federal University of Rio Grande, RS, Brazil

2ND PLACE OVERALL. DEVELOPMENT OF AN ALGORITHM (C++) TO DRIVING A TURTLEBOT INSIDE A MAZE ENVIRONMENT WITH THE AID OF LASER SENSORS. EVENT WEBSITE: [HTTP://ROBOWEEK.C3.FURG.BR/](http://ROBOWEEK.C3.FURG.BR/)

2018

### MSc Scholarship Award (CNPq)

CNPQ, Brazilian Federal Research Funding Agency

FINANCIAL AID AWARD FOR SECOND-PLACE OVERALL IN MSC ENTRANCE EXAM. MINIMUM AWARD AVERAGE OF 70%

2015

### Inter-school Chess Championship

Santa Maria, RS, Brazil

2ND PLACE OVERALL. RESULT: 4-1-0. SWISS PÉTANQUE TOURNAMENT.

2010

## Publications

L. V. Camponogara, "Distribution and Quantum Coherence Manipulation in Multi-Qudit Systems," M.S. Thesis, Ctr. of Nat. and Exct. Sciences., UFSM Univ., Santa Maria, RS, 2017.

L. V. Camponogara, "Dimensional Aspects of Photon Mass in Quantum Electrodynamics," B.S. Thesis, Ctr. of Nat. and Exct. Sciences., UFSM Univ., Santa Maria, RS, 2014.

Viera, L. C.; Muralikrishna, P.; Schuch, N. J.; Makita, K., "Study of Ionospheric Plasma in the South Atlantic Geomagnetic Anomaly Region," INPE/CNPq 114397/2011-2, 2012.

## Technical Production

## Baseline Architectures for Convolutional Denoising Autoencoder

Taipei, Taiwan

- DESCRIPTION: MACHINE LEARNING ARCHITECTURE FOR IMAGE DENOISING WITH AUTOENCODER NEURAL NETWORK DEVELOPED IN PYTHON USING KERAS AND TENSORFLOW.
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/MACHINE-LEARNING-ENGINEERING/AUTOENCODER/](https://camponogaraviera.github.io/machine-learning-engineering/autoencoder/)

2020

## Autoencoder - A Comprehensive Guide

Taipei, Taiwan

- DESCRIPTION: INVITED TALK ON DEEP LEARNING (2H).
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/MACHINE-LEARNING-ENGINEERING/INVITEDTALK/](https://camponogaraviera.github.io/machine-learning-engineering/invitedtalk/)

2020

## Red Blood Cell 3D-Surface Triangulation

Taipei, Taiwan

- DESCRIPTION: A PYTHON IMPLEMENTATION OF EVANS, E. A., AND R. SKALAK (1980) RED BLOOD CELL MODEL FOR THE PURPOSE OF HOLOGRAPHIC TOMOGRAPHY.
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/RED-BLOOD-CELL-3D-SURFACE/](https://camponogaraviera.github.io/red-blood-cell-3d-surface/)

2019

## Generator Network for an Image Deblurring GAN Architecture

Taipei, Taiwan

- DESCRIPTION: MACHINE LEARNING ARCHITECTURE FOR IMAGE DEBLURRING WITH A GENERATIVE ADVERSARIAL NETWORK (GAN) FRAMEWORK DEVELOPED IN PYTHON USING KERAS AND TENSORFLOW.
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/MACHINE-LEARNING-ENGINEERING/GAN/](https://camponogaraviera.github.io/machine-learning-engineering/gan/)

2019

## Logistic Regression Based Facial Expression Recognition

Santa Maria, RS, Brazil

- DESCRIPTION: MACHINE LEARNING ALGORITHM FOR CLASSIFYING HUMAN FACIAL EXPRESSIONS DEVELOPED IN PYTHON USING SCIKIT-LEARN.
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/MACHINE-LEARNING-ENGINEERING/LOGISTICREGRESSION/](https://camponogaraviera.github.io/machine-learning-engineering/logisticregression/)

2018

## Kinematic Algorithm for a TurtleBot in a Gazebo Environment

Rio Grande, RS, Brazil

- AWARD: SECOND PLACE MEDAL AWARDED TO OVERALL INDIVIDUAL TEAM WINNER OF A 24H ROBOTICS COMPETITION (ROBOWEEK) AT THE FEDERAL UNIVERSITY OF RIO GRANDE (FURG), BRAZIL.
- DESCRIPTION: DEVELOPMENT OF AN ALGORITHM (C++) TO DRIVING A TURTLEBOT INSIDE A MAZE ENVIRONMENT WITH THE AID OF LASER SENSORS.
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/ROBOWEEK-CHALLENGE/](https://camponogaraviera.github.io/roboweeek-challenge/)

2018

## Sentiment Analysis using LSTM and Word2Vec

Santa Maria, RS, Brazil

- DESCRIPTION: MACHINE LEARNING ALGORITHM WITH LSTM AND WORD2VEC DEVELOPED IN PYTHON USING KERAS AND TENSORFLOW FOR INSIGHTFUL TEXT ANALYSIS ON ATTITUDE SENTIMENT EXPRESSED IN A BLOCK OF TEXT.
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/MACHINE-LEARNING-ENGINEERING/](https://camponogaraviera.github.io/machine-learning-engineering/)

2018

## Autonomous Software for data Acquisition via a Secure Bluetooth Communication Client-Server Channel

Santa Maria, RS, Brazil

- DESCRIPTION: GUI AUTOMATION SOFTWARE DEVELOPED IN PYTHON WITH BLUETOOTH COMMUNICATION FOR SENSOR DATA ACQUISITION.
- PLATFORM: WINDOWS
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/BLUETOOTH-COMMUNICATION/](https://camponogaraviera.github.io/bluetooth-communication/)

2017

## Snake Game - MVC Standard

Santa Maria, RS, Brazil

- DESCRIPTION: SNAKE GAME WITH AN INTERACTIVE MENU DEVELOPED IN PYTHON WITH PYGAME ENGINE AND MVC STANDARD.
- PLATFORM: DESKTOP
- [HTTPS://CAMPONOGARAVIERA.GITHUB.IO/GAME-DEVELOPMENT/](https://camponogaraviera.github.io/game-development/)

2017

## Supervised Teaching in Quantum Mechanics

Santa Maria, RS, Brazil

- INSTITUTION: FEDERAL UNIVERSITY OF SANTA MARIA
- WORKLOAD: 15H

2017

## Technical Skills

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- Programming Languages: Python, MATLAB, C, HTML5, CSS.
- Frameworks and Libraries: Tensorflow, Keras, scikit-learn, Qiskit, Cirq, sympy, Pygame, OpenCV.
- Others: Git, Linux, Android Studio,  $\text{\LaTeX}$  .

## Languages

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- Portuguese (Native); English (ILR Level 4); Spanish (Professional working prof.); German (Elementary prof.); Chinese (Elementary prof.).

Will be pleased to provide references upon request.