








Renzo Kenyi Takagui Perez

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EDUCATION

Bariloche Atomic Center & Balseiro Institute Master of Science, Theoretical Condensed Matter Physics. GPA: 3.3 ◦ Graduate Courses: Quantum Theory of Solids · Quantum Field Theory · Open Quantum Systems · Topological Matter · Laser Physics · Quantum Many-Body · Material Science · Photonics	Bariloche, Argentina Aug 2022 - Jan 2024
Pontifical Catholic University of Peru (PUCP) Bachelor of Science, Physics. GPA: 4.0 ◦ Teaching Assistant: Classical Mechanics · Intro. to Algorithms · Office hours and assignment grading	Lima, Peru Mar 2016 - Dec 2021

PROJECTS

<i>While being part of the Artificial Intelligence Research Group at PUCP</i>	Nov 2024- Present
<ul style="list-style-type: none">• Lseg-Net  : PyTorch implementation of the ICLR 2022 submission "Language-Driven Semantic Segmentation" by Li et al. Implemented a dense prediction transformer (DPT) from scratch.• Monte Carlo tree search for Connect4  : Python implementation of Monte Carlo Tree Search (MCTS) algorithm for solving the board game. Used upper confidence bound policy for node selection and minimax for optimal move evaluation.• Neural style transfer  : PyTorch implementation of the "Image Style Transfer Using CNNs" paper by Gatys et al. Used a Vgg16 model for feature extraction, and applied Gram matrices for texture learning and image reconstruction.• AI-notebooks  : ipython notebooks implementing AI algorithms. Notable ipynbs: NanoGPT  , Equivariant Neural Networks  , Multi-armed bandit  .	

EXPERIENCE

Algorithms Engineer · Python · PyTorch · Numpy · Git <i>Contract · Remote Sensing Research Lab, Radio Astronomy Institute (INRAS)</i>	Lima, Peru May 2024 - Oct 2024
<ul style="list-style-type: none">• Developed a novel inversion algorithm in computational aeronomy based on multi-quasi-parabolic layers  that reconstructs the electron density profile given ionospheric radio wave reflection data.• Implemented an encoder-decoder CNN in Pytorch for ionospheric echo detection for an ionogram data processing pipeline.• Wrote 2000 lines of Python to implement theoretical work.	
Software Engineer Intern · Python · Docker · Git · Github <i>Fromsolvers</i>	Lima, Peru Jan 2024 - Mar 2024
<ul style="list-style-type: none">• Part of the backend development team for the implementation of a Multiplayer Trivia Game App for sports and esports.• My work was mainly in Python and we developed a RESTful API with Django for the database and FastAPI framework.	
Theoretical Condensed Matter Scientist · Julia · Python <i>Bariloche Atomic Center and Balseiro Institute - Supervisor: PhD. Armando Aligia</i>	Bariloche, Argentina Aug 2022 - Dec 2023
<ul style="list-style-type: none">• Researched the robustness of the topological protection of Majorana zero mode quasiparticles in superconducting nanowire systems using simple effective low-energy Hamiltonians and self-consistent Hartree-Fock methods.• Demonstrated that Coulomb repulsion compromises Majorana end states' topological protection only in short nanowires.• Published results in Physical Review B.	
Undergraduate Researcher <i>Combinatorics Research Group, USP - Supervisor: PhD. Yoshiharu Kohayakawa</i>	Sao Paulo, Brasil · Lima, Peru Feb 2022 - Apr 2022
<ul style="list-style-type: none">• Worked on quantum communication protocols where two spatially separated parties could solve a distributed task.	
<i>Physics Department, PUCP - Supervisor: PhD. Pablo Bueno, University of Barcelona</i>	Mar 2021 - Dec 2021
<ul style="list-style-type: none">• Worked on calculating the entanglement entropy for free scalar bosons, and exploring holographic entanglement entropy via the Ryu-Takayanagi formula. 	

PUBLICATIONS

Effect of interatomic repulsion on Majorana zero modes in a coupled quantum-dot-superconducting-nanowire hybrid system R. Kenyi Takagui-Perez and Armando Aligia · 2024 Physical Review B (PRB) [ArXiv] [PRB]	
A note on an inversion algorithm for vertical ionograms for the prediction of plasma frequency profiles R. Kenyi Takagui-Perez · 2024 arXiv Preprint [ArXiv] [Repository]	

COURSEWORK

Summer School of Machine Learning - PUCP	Jan. 2025
Deep Learning Specialization - DeepLearning.AI 	Sep. 2024
Competitive Programming Training Camp - Argentina	Jun. 2020
Brazilian ICPC Summer School - Brasil	Jan. 2020

HONORS AND AWARDS

• Scholarship from the National Atomic Energy Commission, Government of Argentina	2023,2022
• Highest-Graded Undergraduate Thesis in Physics	2022
• Top 25, ICPC (International Collegiate Programming Contest) South America Finals ◦ Compited against 150 teams and 450 students from 6 countries. Last phase before World Finals.	2020,2019
• Top 100, IEEEExtreme (IEEE 24h Annual Hackathon) ◦ Ranked in the top 1.7% out of 5570 teams in 2021 and in the top 2.6% out of 3722 teams in 2020.	2021, 2020
• Top 10, International Theoretical Physics Olympiad for Undergraduates	2019

PROFESSIONAL SKILLS

Programming:	Python · C/C++ · Julia
Frameworks:	PyTorch · TensorFlow · NumPy
Tools:	Jupyter Notebooks · Github · Git · Bash · L ^A T _E X
Languages:	Spanish(native) · English(advanced) · Portuguese(basic) · French(basic)

EXTRACURRICULAR ACTIVITIES

Competitive programming, literature, music interpretation, endurance cycling