César Díaz Blanco

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Education

University of Tübingen   **Tübingen, Germany**
M.Sc. in Machine Learning (1.73/1.00)   *since 10/2023*

University of Illinois at Urbana-Champaign   **Urbana-Champaign, USA**
B.Sc. in Engineering Physics (3.94/4.00 GPA) with Highest Honors   *08/2019 – 05/2023*
Minor in Computer Science (4.00/4.00 GPA)
Coursework: Data Structures, Algorithms, Computer Architecture, Systems Programming
Deep Learning, Computational Photography, and Machine Perception

Work Experience

DeepScenario   **Stuttgart, Germany**
Working student in software and computer vision engineering   *since 09/2024*

- Developed interactive visualization scripts with the `vedo` 3D plotting library.
- Prepared the data release of reconstructed scenes by adjusting mesh size.
- Improved code readability by adhering to PEP8 guidelines through `mypy`.

Projects

Dynamic Gaussian Splatting Viewer for Head Avatars

- Enabled on-the-fly curly hair editing with controllable amplitude and frequency
- Implemented a gaussian axes view with OpenGL using vertex and fragment shaders
- Optimized loading of frames either from dynamic avatars or hair editing features

Neural network framework from scratch using NumPy

- Implemented backpropagation with support for sigmoid, softmax, ReLU, and linear layers
- Built in several optimizers including Adam, mini-batch SGD, and SGD

Research Experience

IBM-IL Discovery Accelerator Institute   **Urbana, USA**
Qutrit Quantum Systems Researcher   *08/2022 – 05/2023*

- Constructed a Hamiltonian to manipulate a transmon as a qutrit through EM pulses
- Developed Monte Carlo simulations to identify optimal ways to measure multilevel coherence

Computational Astrophysics with Professor Charles F. Gammie   **Urbana, USA**
Student Researcher and Test Developer   *05/2021 – 05/2023*

- Implemented test problems on C/C++ to assess the correct evolution of the fluid's entropy in the group's second-order, conservative simulation parallel code
- Analyzed error convergence of the fluid variables to the analytical solution by calculating its norm across multiple parameters and several timescales

Skills

- Languages: Spanish (Native), English (Fluent), German (Basic)
- Coding: Python (Advanced), C/C++(Intermediate), PyTorch(Intermediate), SQL, Java (beginner)

Presentations

Illinois Scholars Undergraduate Research Expo   Urbana, USA
Multilevel Coherence and Manipulation of Transmon Qutrits   *04/2023*

Astronomy Summer Undergraduate Research Symposium   Urbana, USA
Electron Heating in the relativistic fluid code KHARMA   *08/2022*

Teaching Experience

Private Tutor   Urbana, USA
AP Calculus BC and AP Physics C   *08/2022 – 12/2022*
- Worked one-on-one with junior high school students to understand their reasoning process.
- Developed comprehensive and general frameworks to tackle most Physics problems at the high school and early college level coursework.

Extracurriculars

Introduction to digital cinema production   Urbana, USA
Director, camera operator, actor   *08/2022 – 12/2022*
- Helped amateur actors through drama scenes to avoid pedantic or unserious performances.
- Worked around the constraints of filming with smartphones and confined places.

Guidance for Physics Students Club   Urbana, USA
Member   *08/2019 – 05/2021*
- Learned about doctorate students' research on biophysics, quantum physics and astrophysics.

Honors and Awards
- Quantum Ideas Summer School Travel Grant, STAQ at Duke University   *2023*
- Yee Seung Ng Scholarship Recipient, Physics Department at UIUC   *2022*
- Richard K. Cook Scholarship Recipient, Physics Department at UIUC   *2021*
- Graduated with Academic Excellence from High School. Unweighted: 95.37%   *2018*
- 5th place at World Educational Robotics Contest, Shanghai, China   *2017*

References

Charles Gammie
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