

POL GÓMEZ RIQUELME

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EDUCATION

The University of Chicago

B.S. in Computer Science and Mathematics

Chicago, IL

June 2020

- **GPA:** 3.63 — Dean's List 2016-17 & 2017-18, Odyssey Scholar
- **Courses:** Introduction to Computer Systems, Honors Discrete Mathematics, Abstract Linear Algebra, Group Theory, Advanced Analysis in \mathbb{R}^n (I-II-III)

EXPERIENCE

Mathematics REU at The University of Chicago

Researcher

Chicago, IL

June 2018 – August 2018

- Wrote a 30-page graduate-level introduction to algebraic number theory
- Provided periodic progress reports and summarized project results for a non-mathematical audience

Autonomous University of Barcelona (UAB)

Researcher

Bellaterra, Spain

June 2017 – September 2017

- Compiled novel results on polynomial functors under the guidance of Prof. Joachim Kock
- Wrote a technical survey on the fundamental concepts of category theory and its applications

Institute of Photonic Sciences (ICFO)

Research student

Castelldefels, Spain

July 2016

- Implemented industry standard fast Fourier transform JPEG compression algorithm in MATLAB and C++ achieving image space savings of up to 90%
- Created a set of image processing tools in MATLAB allowing adjustments to brightness, contrast, color palette and sharpening

Research Science Institute (RSI)

Research student

Boston, MA

July 2015 – August 2015

- Proposed mathematical conjecture on combinatorics and tested its validity with Python (SageMath)
- Wrote technical paper on research results at MIT Mathematics Department
- Presented research to audience of 30+ at final conference

Catalunya-La Pedrera foundation

Project collaborator

Remote

August 2014 – January 2015

- Automated near-Earth object detection on collection of ~500 telescope images using Python
- Used astronomical imaging software MaximDL to compute accurate differential photometric figures

PROJECTS

Pure Rust Blockchain on [GitHub](#)

August 2018 – Current

- Designing a TCP socket-based blockchain node messaging protocol encoded by the MessagePack library
- Implementing user-to-node communication with JSON-RPC through HTTP transport

CHIP-8 System Emulator on [GitHub](#)

January 2018

- Wrote fully-featured CHIP-8 emulator in Rust capable of running game ROMs
- Programmed CPU emulator with configurable clock speed and graphics system through the SFML library

C++ Rendering Engine on [GitHub](#)

November 2017 – January 2018

- Designed an OpenGL rendering pipeline configurable through JSON files
- Implemented a double-frame game loop to allow lock-less synchronization between graphics and game logic threads

Machine Learning on [GitHub](#)

December 2013 – June 2014

- Received *National Youth Research Prize* (Catalan Government)
- Programmed virtual self-driving car through Q -learning
- Implemented hand-written digit recognition through FANN library neural networks

SKILLS

Programming Languages

C, C++, Python, Rust, Javascript (Angular and Node), SQL, \LaTeX

Software & Tools

GNU/Linux (bash, gdb), Visual Studio, `git` and `svn` workflows

Languages

Fluent English, Native Spanish and Catalan, Basic French and Russian