

# Riccardo Bonfanti

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## Summary

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Master's student in Computer Science with a focus on **Computer Graphics**, GPU programming, and high-performance systems. Currently working on extending Gaussian Splatting techniques for immersive **CAVE-based visualization**.

## Education

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**University of Illinois at Chicago**, Master of Science in Computer Science. Jan 2025 – Aug 2026 (Expected)

- Current GPA: 3.86/4.0

- **Coursework:** Advanced Topics in Software Engineering, Secure Web Application Development, Computer Security, Computer Graphics, User Interface Design, High Performance Processors and Systems, Artificial Intelligence.

**Politecnico di Milano**, Master of Science in Engineering of Computing Systems. Sept 2024 – Dec 2026 (Expected)

- Current GPA: 3.9/4.0

- **Coursework:** Software Engineering II, Computer Graphics, Distributed Systems, GPUs & Heterogeneous Systems, Advanced Algorithms and Parallel Programming.

**Politecnico di Milano**, Bachelor in Engineering of Computing Systems. Sept 2021 – Sept 2024

- Final GPA: 3.68/4.0 (Degree final mark: 108/110)

## Experience

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**Research Assistant | Master's Thesis**, University of Illinois – Chicago, IL Jan 2026 – May 2026

- Architected a custom Unity URP-based renderer to visualize real-time **Gaussian Splatting** datasets within a **CAVE immersive environment**. Engineered multi-screen projection logic for a 7620x1890 resolution setup. Optimized memory pipelines for .ply splat data loading to process **10M-200M splats** at a stable, hardware-capped **60 FPS**.

- Tools Used: Unity (URP), C#, HLSL, GPU programming.

## Projects

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**Embarrassingly Sequential, Finite State Automata Computations on RISC-V SoftGPU**

- Designed and implemented a lightweight custom kernel in OpenCL to accelerate automata processing on the **Vortex soft-GPU**, improving pattern-matching performance up to **1.7 IPC**.

- Tools Used: C++, OpenCL, Vivado.

**Physically-Based Projector Simulator with Custom Shader**

- Developed a **real-time projector simulation** system in Unity, modeling optical properties and projecting **dynamic heatmap textures** onto physically-based materials.

- Tools Used: Unity, C#, HLSL, GPU Shader Programming.

**Campus ART – Interactive Augmented Reality Web Experience**

- Designed and implemented an **AR web application**, allowing users to discover and contribute to collaborative virtual art hotspots via real-time geolocation. Architected a **secure backend**, implementing server-side GPS verification and both relational database and object store.

- Tools Used: Next.js, TypeScript, MindAR, Drizzle ORM, Geolocation API.

**Codex Naturalis - Software Engineering project**

- Engineered a **real-time, multiplayer** adaptation of a board game using a custom client-server architecture. Programmed concurrent networking capabilities and a responsive GUI, synchronizing game state across up to **100 sessions**.

- Tools Used: Java, JavaFX.

## Technologies

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**Languages:** Java, C, C#, C++, Python, JavaScript, SQL, HTML.

**Tools:** Git, VS Code, IntelliJ, Pycharm, Docker, Vivado.

**Graphics & GPU:** OpenCL, WebGL, HLSL, Unity Shader.

## Leadership & Volunteering

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**Associazione Amici di Lollo - amcidilollo.it** Sept 2016 – present

- Contributing as an **member & associate** of a nonprofit supporting pediatric oncology research and awareness.

## Awards & Achievements

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- **Best Freshmen Award** (2021–2022) – Recognized among top-performing first-year students for academic excellence.