Nicholas Karalis

+1 (949) 445 9457   - nkara012@ucr.edu   - linkedin.com/in/nkaralis/   - github.com/Googoo03

EDUCATION

University of California, Riverside   **Riverside, CA, USA**
Bachelor of Science, Computer Science   *September 2021 - June 2025*
Relevant Coursework: Software Development, Embedded Systems, Machine Learning, Data Structures, Deep Learning, Parallel Systems, Operating Systems, Multithreading, Algorithms, Automata, Complexity, Graphs, Agile

TECHNICAL SKILLS

Programming Languages: Python, C++, C#, C, Java, Javascript, HLSL, Assembly, HTML/CSS, SQL
Libraries and Tools: Git, Linux (Ubuntu), Visual Studio, UML, MySQL, Numpy, Pandas, SFML, Yacc, Bison, AWS, ASP.NET, Node.JS, CSV, JSON, XML
Languages: English, Russian, Spanish

RELEVANT PROJECTS

- Procedural Generation Game - Little Backyard — *C#, HLSL, Unity3D, JSON*, An ongoing passion project that uses layered noise algorithms to develop reproducible landscapes in real-time.
  - Uses **quadtree algorithms** for a dynamic Level-of-Detail system, improving framerate by 200%.
  - Uses **Unity's** shader pipeline to compute noise **algorithms** in **parallel**, improving performance by 10x.
  - Uses **OOD/OOP** for scalable improvements to landscape classes.
  - Makes extensive use of **Vector** and **Matrix math** to Ray Trace environments.

- Custom Compiler — *Yacc, Bison, C++*, A custom compiler developed in a team of 3 people over the course of 10 weeks as part of a compiler course.
  - Uses **Graphs** and **OOD** to efficiently generate parsing trees for the context-free grammar.
  - Held under tight deadlines to finish project without bugs or faults.
  - Used **Linux** for automation and managing code on public server.
  - Used **git** for effective version control and merge team members' work.

- 2D RPG "Fantasma" — *C++, CMake, SFML*, A game project developed in a group of 4 over the course of 10 weeks using **SCRUM**. I contributed to the procedural landscape, inventory system, and combat system.
  - Extensively uses **OOD** for efficient code management.
  - Used **Unit Testing**, **OOD**, and **Dynamic Programming**.
  - Used **git** for version control and merging team members' work.
  - Developed the procedural landscape, inventory system and combat system.

- Embedded Systems Game Console — *C, C++, Arduino*, A game project that uses the Arduino UNO board to create an NES-type video game. Is an ongoing project to maximize utility despite storage constraints.
  - Extensively uses **State Machines** for efficient code management.
  - Used **git** for version control and merging team members' work.
  - Uses **Data Structures** that were built from the ground up.

WORK EXPERIENCE

PhysBAM Contributor
University of California - Riverside, CA, USA   *August 2024 - Present*
- Work under Craig Schroeder as a unit tester and contributor to his research physics simulation library, PhysBAM.
- Subject to consistent code review to ensure qualitative development.
- Work with Linux OS on a shared git with 6 Ph.D researchers.

Academic Tutor
Downtown Academics, CA, USA   *October 2018 - August 2021*
- Taught students to program with **C++**, **C#**, **Python**, and **Scratch**.
- 90% of all my students saw an increase in grades by at least 10%.
- Taught grades K-12 all core subjects, including STEM, History, and English. This includes AP tests and SAT exams.

EXTRACURRICULAR

- **Robotics Instructor** for Area Youth Ministry, Riverside - July 2024
- **Member** in GameSpawn Club - January 2024 - Present