Cătălin-Alexandru Rîpanu

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Education

POLITEHNICA University of Bucharest **September 2020 – July 2024**
Faculty of Automatic Control and Computers *Bucharest, Romania*

- Bachelor's Degree in Computer Science, **GPA: 9.805/10**.
- Relevant **coursework**: Data Structures, Network Protocols, Computer Architecture, Parallel Programming, Electronics, Programming Paradigms, OOP, Algorithms Design, Numerical Methods, Operating Systems, Machine Learning.

Work Experience

POLITEHNICA University of Bucharest **February 2022 – July 2024**
Undergraduate Teaching Assistant *Bucharest, Romania*

- Taught students **C, Numerical Methods and OOP** in order to help them solve problems related to real-world ones.
- Helped in grading projects, midterms and final exams.

Projects

Seven-Segment LED Display on FPGA | *Verilog, Vitis HLS, C++, Vivado* **January 2023**

- Created a *C++ project* which takes 8 signals as input from a Nexys A7-100T board and shows the right number on it.
- Implemented the Double Dabble algorithm for simplifying the conversion between **Binary** and **BCD** formats.
- Operated with High-level synthesis process so that the C++ behavioral specification is used along with a constraint file.

Car Race | *C++, OpenGL, OOP, GLSL* **December 2022**

- Developed a *Car race* based game using C++, OpenGL and Graphics Design techniques.
- Designed a curvature effect in **Vertex Shader** modifying the 'y' coordinate of all the objects' vertices in the scene.
- Implemented collision detection with opponents (which are dynamic objects) using the **Sphere vs Sphere** test.
- Created a complex shape of the road rendering a large density of triangles so that no visual artifacts are generated.

2016 Halite Bot | *Algorithms, OOP, C++, Techniques Design* **May 2022**

- Implemented in C++ a *Halite bot* using techniques such as Divide and Conquer, Greedy and Dynamic Programming.
- Processed the **highest score cells** first so that the goal of the design (which is saving the bot's strength) is achieved.
- Developed a greedy approach used by the border cells so that all the unoccupied cells will be attacked.
- Created a **strength loss correction** method which uniformly redirects power to all own cells for minimizing the waste.

RPG Adventure Game | *Java, OOP, JSON, Swing, Design Patterns* **December 2021**

- Designed a *Complex RPG* based game using Java and JSON files for **storing accounts** which are used for **logging in**.
- Implemented a functionality which allows the user to choose between 2 game formats (**GUI** and **CLI**).
- Developed a method such that there is a probability that an enemy can **double** it's damage or **dodge** the user's attack.

Extracurricular Activities

POLITEHNICA University of Bucharest **February 2022 – July 2024**
Undergraduate Student Assistant *Bucharest, Romania*

- Participated as an **invigilator** along with professors in final exams.

3DPUB Summer School **June 2022**
2^{nd} *Year Student* *Bucharest, Romania*

- Participated in 5 **Gameloft** and **UPB** *workshops* related to GPGPU, Computer Vision and Game Development.
- Understood the implementation details of **Multiplayer** functionality and **Artificial Intelligence** in modern games.

Awards

National Student Mathematics Competition "Traian Lalescu" **November 2021**
2^{nd} *Year Contestant* *Transilvania University of Brasov, Romania*

- Participated in the **National phase** and obtained the 3^{rd} prize of the **Complex Analysis** section.

Skills

Technical Skills

- Intermediate Knowledge: **C/C++**, OOP, Computer Networking and Architecture, **Java**, Algorithms Design, Linux
- Basic Knowledge: Python, x86 Assembly Language, Haskell, Prolog, Verilog, Parallel Programming, Bash scripting

Languages

- Romanian: Native Speaker
- English: Professional Level
- French: Good Command