Alessandro Scala

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About me

I am a PhD student with extensive experience in programming and developing in multiple fields, which I gathered by working on several projects at the **University of Pisa**, at the **Apple Developer Academy**, by working in the industry as a Game and Tool Developer, and by working on several personal projects. I am now looking to advance my career in game development.

Education

2024–... **PhD – Computer Science** **University of Edinburgh**
Currently working on process algebras and models of concurrency.

2022–2024 **M.Sc. – Computer Science** **110/110 cum laude** **University of Pisa**
Curriculum: "Software: Programming, Principles, and Technologies"
Thesis: "Runtime Verification through Algebraic Effect Handlers"

2019–2022 **B.Sc. – Computer Science** **110/110 cum laude** **University of Pisa**
Thesis: "Authenticated Quantile Digests for Blockchain Systems"

2018–2019 **Apple Developer Diploma** **Apple Developer Academy**

2013–2018 **High School Diploma** **Liceo Classico Statale Umberto I**

Experience

10/2023–05/2024 **Graduate Teaching Assistant** **"Programming and Algorithms"** **University of Pisa**

- Assisted students on harder-to-grasp concepts.
- Provided exercises and solutions for topics studied in class.
- Discussed exercises in class to help build intuition.
- Supervised class during written exam.

12/2022–02/2023 **Game and Tool Developer (Internship)** **Clockwork Society**

- Gameplay design and development in **C++** on a custom multiplatform game engine.
- Tool development in **C#**, with **C++/CLI** components to interface with the game engine.

2018–2019 **Software Developer** **Apple Developer Academy**

- Worked on several projects with multiple, diverse teams.
- Learnt how to fast prototype and iterate on ideas to find better solutions to the target problem.

Notable Projects

MeshLab plugin **University of Pisa**
I developed a **MeshLab** plugin to remesh a surface using the **OpenVDB** library. **Key takeaways:** handling of low level geometric data, conversions of 3D assets between different formats, manipulation of geometric properties on low level data structures, integration of new code into a large codebase.

3D Rendering Engine in WebGL **University of Pisa**
I developed a **WebGL** rendering engine, designed to be easy to use and to provide a programming interface similar to other popular engines. The engine has been written from scratch and includes a number of shaders to provide multiple level of graphical detail and various kinds of effects. **Key takeaways:** real-time rendering, dynamic lighting, multiple shadow mapping techniques, post processing effects, rendering pipeline design.

Uta Stansburiana Simulation in Godot **University of Pisa**
I developed a 3D simulation of a population of lizards (*uta stansburiana*) on the **Godot Game Engine**. The simulation has a number of features to influence the simulation and to visualise various data. Despite the short time available to complete the project, it was evaluated with full marks, and was a good exercise in rapidly prototyping on a game engine.

Baum AR **Apple Developer Academy**
An **Augmented Reality**-focused social network where you can share AR experiences with the world and view them on the fly. Developed with a team of Apple Developer Academy alumni. I worked mainly on the platform backend and on the AR viewer, while also helping create a **UI framework** to easily implement a consistent look and feel.

Publications

2024 **"Techniques for Authenticating Quantile Digests"** **arXiv**

Skills and Abilities

Programming Languages: C, C++, Java, OCaml, Haskell, Python, GDScript, JavaScript, Kotlin, Swift
Technologies & tools: Unity, Godot, OpenGL, GLSL, git