Andrea Venuta

Freelance Software Developer

Education

MSc Finance & Risk Management
Università degli Studi di Firenze — *ongoing*

Informatica SS. MM. FF. NN. — 103/110
Università degli Studi di Firenze — *2015*

Thesis: Procedural Content Generation and Real-time Rendering Algorithms

Diploma di Perito Informatico — 100/100
I.T.I.S. "T. Buzzi" — *2008*

Contacts

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Skills

Front-end Web Development

Experienced in the design and development of complex, responsive, cross-browser applications with data-visualization and custom interactive components. Well-versed in ECMAScript6 and proficient in architecting maintainable workflows.

Graphics Programming

Experienced in real-time rendering algorithms on the OpenGL pipeline. Familiar with computational geometry, algorithms for 3D model procedural generation, representation and animation, and shading algorithms.

Machine Learning

Experienced in working with neural networks for AI-based decision making and pattern recognition. Interested in deep learning and modern ML techniques.

Other

Experienced in developing desktop applications in C#/WPF, Java/JavaFX and Electron. Experienced in developing native Android apps. Experienced in developing Node.js backends. General knowledge of scripting languages such as Python, Ruby and Matlab for scientific computing. Knowledge of low-level programming in languages such as C/C++ and x86 assembly. Knowledge of LaTeX.

Professional experience

Standouter.com — *08/2011 - 08/2012*

Bootstrapped the first version of the website, working fullstack on a LAMP backend and a JQuery-based frontend.

GWC World — *08/2011 - 06/2013*

Fullstack web development of many small web applications for communication campaigns designed by the agency. Fullstack development of a large bed-and-breakfast booking platform, on a CodeIgniter-based backend. Front-end development of an interactive indoor map design tool for exhibitions.

Interfase s.r.l. — *08/2012 - present day*

Development and architecture design of interactive data visualizations and domain-specific tools, such as: a multi-monitor interactive data visualization installation, controlled from a terminal with a local ad-hoc network; a distributed multi-device Virtual Reality immersive video player, with playback controlled by a narrator with a remote application; a GIS tool for visually designing domain-specific scenarios, feeding the result to a mathematical model engine and reporting upon its output.

Academic and personal projects

Thesis: Procedural Content Generation and Real-time Rendering — *2015*

I researched and designed a mathematical formalism by merging parametric open L-systems and shape grammars to define urban architectural elements and procedurally generate 3D models of cities. The models were textured with signal function-based, anti-aliased procedural textures and rendered in the context of a deferred, multi-pass shading renderer. The thesis can be read on my personal website.

Neural Network exam project: Gesture Recognition — *2014*

In this project I developed, along with a colleague, a sign language "typewriter" by training an artificial neural network with data sourced from a Leap Motion controller. Every time a threshold on the classification for a sign is passed, the corresponding letter is output.

JS1K competition — *2014, 2015*

I competed twice in the yearly JS1K, a competition based on writing web-based visualizations in at most 1024 bytes of Javascript code. I submitted a minimal tunnel visualization in 2014 and a Perlin noise implementation in 2015.

Goals and interests

Researching the viability of machine learning techniques, such as artificial neural networks and deep learning, in the context of high-frequency trading strategy planning.

Studying functional programming techniques and languages, such as Haskell and Erlang, to develop fault-tolerant, mathematically testable automated trading systems.

Studying the state of the art in graphics programming, with the objective to develop a high-performance, photorealistic, physically based videogame rendering engine.