Software Engineer
Computer Science and Applied Mathematics

Sébastien Tourneux
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Computer Graphics Software Engineer
available from October 2015

Profile

I am a passionate and problem-solving computer science engineering student specialized in computer graphics. My strengths lies in my creative sensibility and my understanding of artists' needs.

Skills

Programming	**C++, Java, Python**, C, Ada, Caml Light Tools : *Qt, Agile development, UML, Git/SVN, Eclipse/Qt Creator/Visual Studio*
Computer Graphics	**GLSL , Maya scripting (Python/Maya API), OpenGL**
Theoretical	CG theory, Surface modelling (Spline, NURBS), Algebra, Analysis
Art	*Autodesk Maya , Adobe Photoshop, Illustrator, InDesign, After Effects*
Language	French : native speaker English : TOEIC : 965/990, advanced level Spanish : intermediate level

Experience

March-August 2015   **Research Engineer Intern at Dassault Systèmes** *(Paris, France)*
C++, CUDA, Visual Studio
Simulation of deformations in thin materials such as crumpled paper and wrinkled cloth.
- Implementation of SIGGRAPH 201x papers
- Creation of a real-time and interactive prototype for deformable materials
- Mesh processing and refinement
- GPU programming

January 2015   **Deformation tool in Autodesk Maya** *(school project)*
C++, Maya API, MEL
Implementation of cage-based Green deformers (SIGGRAPH 2008) as a Maya plugin.
- Analysis and state of the art of cage-based deformers
- Maya API (MPxNode, MFnMesh)
- Implementation of an interactive deformation tool
Demonstration: sebastientourneux.fr/green-coordinates-in-maya

November 2014
January 2015   **Augmented drawing device** *(school project)*
C++, Qt, Optitrack device
An augmented drawing device helping artists' interaction with computer.
This non-intrusive tool is integrated to the classical pen/paper workflow of the artist and allows drawing capture and correction.
- Creation of a post-WIMP interaction
- Use of the Optitrack MOCAP device
- Implementation of a prototype demonstrating the uses of the device
Demonstration: sebastientourneux.fr/drawing-track

June-August 2014 **Software Developer Intern at Inria's research laboratory**
(Grenoble, France) in team IMAGINE
C++, C, Qt
Initiation of the industrial maturity phase of a micro-fabrication software.
This software is used in micro-3D printing (nanometer-sized objects) and was developed
by Inria, in collaboration with a physics laboratory and a micro 3D printers selling company.
- Study of modifications needed
- Conception of a validation plan
- Remodelling of the user interface
- Remodelling of the software architecture

June 2014 **Conception and implementation of an intuitive 3D modeller** *(school project)*
(3 weeks) *C++, Qt, OpenGL*
This software makes the creation of characters and smooth objects easy. It focuses on an
ergonomic and enjoyable interface. It has been developed as end-of-year school project
by a team of 4 students, in collaboration with Inria's research team IMAGINE.
- Design of the software architecture
- Design of an intuitive interface
- Use of implicit surfaces (or "meta-balls")
- Implementation of a research publication for controlled blending between surfaces
- Research and implementation of a detail adding method using implicit surfaces
- Study of user behaviours and feedbacks
The functional software allows a non-trained user to easily create complex characters such
as a cartoon dragon in less than 10 minutes. It allows the export of the created object
with the aim of 3D printing.
Demonstration: sebastientourneux.fr/blob-factory

February-May 2014 **Discover of the research work at Inria's laboratory** *(Grenoble, France)*
Feature analysis in 3D CAD objects.
I was part of a research team one day a week.
- Study of the state of the art
- Research on symmetry analysis
- Study of Voronoi diagrams and Delaunay triangulation
- Conception of an algorithm for the detection of feature's repetitions
- Implementation of the algorithm
The algorithm produced is able to recognize linear and circular repetitions of a feature
even in complex configurations with many outliers.

February-May 2014 **Programming a 3D short movie from scratch** *(school project)*
C++, Qt, OpenGL
The project asked to create an underwater scene just by writing code. The challenge
was to create complex animations mixing scripted animations and physical simulations
without using any side creation software.
- Development of an API allowing the creation of a scenario
- Development of a mesh data structure and mesh modification
- Creation and animation of complex characters using basic geometric primitives
- Render of water using a resolution of a simplified Navier-Stokes equations
- Render of water caustics using a texture loop
- Procedural generation of an underwater city
This project taught me OpenGL basics and made me implement classical CG algorithms
from scratch.
Demonstration: sebastientourneux.fr/open-gl-short-movie

Education

2012 − 2015	**Master of Science in Computer Science - *Major in Imagery***
	National Graduate Engineering School of Informatics and Applied Mathematics
	Grenoble INP - Ensimag (Grenoble, France)
2014 − 2015	Third year :

- High performance computing for mathematical models
- HCI : Post-WIMP interactions
- Computer vision
- Advanced imaging
- 3D modelling and animation engineering

(modelling and animation theory and Maya plugins development)

- Computer Graphics : Rendering and animation

2013 − 2014 Second year : specialization in Image, Mathematics and Simulation

- Object-Oriented Programming and software engineering
- Concurrent programming basics
- Analysis and numerical data management
- Partial differential equations and finite elements
- Probabilistic models and statistical methods
- Image processing
- Computer aided geometric design
- 3D Computer Graphics theory

2012 − 2013 First year : basics of computer science and applied mathematics

- Unix and shell programming
- Algorithmics
- Numerical methods and algebra
- Analysis
- Graph theory

2010 − 2012 **Classe préparatoire aux Grandes Ecoles** *(Orléans, France)*

Two-year-long undergraduate intensive course in mathematics and physics to prepare for entry exams to top graduate engineering schools.

- Algebra
- Analysis and differential geometry
- Physics (Mechanics, Thermodynamics, Electromagnetism, Optics)
- Computer science theory
- Philosophy

Special achievement

Design and creation of a 32-pages advertising brochure
for the school Grenoble INP - Ensimag.
- Photos and articles gathering during a year
- Image processing using Adobe Photoshop
- Desktop publishing Adobe InDesign and Adobe Illustrator
- Dialog with the school administration for validation

The brochure was printed and sent to 5000 students who prepared the entry exam.

Interests

Sports	Basketball team captain, Judo, Swimming
Student association	Designer for a student association (print art, logos and brochures)
Art	Graphic design, urban art, animation movies *Portfolio: sebastientourneux.fr/art*
I like	Everything that looks beautiful

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