PhD and Engineer in Computer Science and Applied Mathematics

Sebastien MONDET

Personal Information

Born on 1982-03-20, in Madrid, Spain. French nationality.
▷ `seb@mondet.org` — `http://seb.mondet.org`.

Work Experience

Since Sept. 2009: Post-doc at the University of Oslo

Distributed Multimedia Systems (DMMS) group, University of Oslo, Norway.
- ▷ *SIRIUS Project:* Sensing, Adapting and Protecting Pervasive Information Spaces.
- ▷ Working and advising PhD and Master students on Quality of Information, Distributed Complex Events Processing, Anomaly Detection, Safety and Security, within Sparse Mobile Ad-Hoc Networks, and Resource-Constrained Devices.
- ▷ Personal work on protection middleware with focus on *safety and security of implementations* through meta-programming and formal methods (*IFIP Sec'11* paper; *Promiwag* project).

Oct. 2006 – Jun. 2009: PhD in Computer Science

IRIT, University of Toulouse, France.
Simulation of large 3D natural scenes: modeling and adaptive streaming.
- ▷ *Supervision:* Prof. Mathias Paulin, Geraldine Morin, Romulus Grigoras (Vortex group).
- ▷ *Research focus:* Server resources optimization, multi-resolution content packetization, compression and progressive modeling of plant models, network measurements.
- ▷ *Software realizations:* "Wadis," "LibGenCyl," and "OMAN". Also involved in the development of "NatSim" a visualization tool for natural scenes (Python, OpenGL/GLSL).
- ▷ *Co-Advising:* Master and Engineering students working on 3D streaming for mobile devices.
- ▷ *Internship:* Three months (2008) at the National University of Singapore, under the supervision of Dr. Wei Tsang Ooi.
- ▷ *Teaching:* Assistant at INP-ENSEEIHT ("Monitorat"), labs in C Programming, Geometric Modeling, 3D Rendering, Operating Systems, Data-Bases, Multimedia.
- ▷ *Dissertation: "Adaptive Modeling and Distribution of Large Natural Scenes,"* PhD thesis reviewed by Pr. Stefanie Hahmann and Pr. Eckehard Steinbach, and defended on June 8th, 2009.
- ▷ The thesis received the Léopold Escande Award 2009.

Jul. 2005 – Sept. 2006: Software Engineer

Avionics Department, Atos Origin Integration (Toulouse, France).
- ▷ Development for Airbus (EYY) of *embedded* air/ground communication software *qualified* under the DO-178B standard (HOOD design, ANSI C, LynxOS, RTRT).
- ▷ Development for Airbus (EYT) of avionic networks testing software (ARINC 429, AFDX, UML, C++, wxWidgets).

Feb. – Jun. 2005: Master Thesis

Computer Vision Team, IRIT - UMR 5505 (Toulouse, France)
Streaming of large point-based 3D scenes, adaptation to resources and navigation.
- ▷ *Keywords:* Point based 3D, Compression, Adaptive Streaming.
- ▷ *Implementation:* Client-Server system over HTTP, TCP and DCCP; C++ with Qt/OpenGL on GNU/Linux.
- ▷ *Advisors:* Geraldine Morin and Romulus Grigoras.

Jun. – Jul. 2004: Engineering Internship

Dassault Aviation, (Biarritz, France)
Processing and visualization module for numerical data measured during polymerization in autoclaves.
- ▷ Technical specifications writing, C++ development for MS-Windows, and Shell/C development for AIX/RS6000.

2000 – 2003

Various summer jobs: Math and Spanish private lessons, municipal city cleaning …

Publications

International Journals
- ▷ Cheng, W., Ooi, W. T., Mondet, S., Morin, G., and Grigoras, R.; *Modeling Progressive Mesh Streaming: Does Data Dependency Matter?* ACM TOMCCAP, Vol. 7, Is. 2, 2011.
- ▷ Cheng, W., Mondet, S., Ooi, W. T., Grigoras, R., and Morin, G.; *Network-Aware Streaming of Partially Ordered Media.* IEEE COMSOC MMTC E-letter Volume 5, Number 6, 2010.
- ▷ Mondet, S., Cheng, W., Morin, G., Grigoras, R., Boudon, F., and Ooi, W. T.; *Compact and progressive plant models for streaming in networked virtual environments.* ACM TOMCCAP, Vol. 5, Is. 3, 2009.

International Conferences
- ▷ Mondet, S., Alberdi, I., and Plagemann, T.; *Generating Optimised and Formally Checked Packet Parsing Code*. Accepted for the IFIP SEC'11 conference, 2011.
- ▷ Kamisiński, P., Mondet, S., Goebel, V., and Plagemann, T.; *Resource-Aware Complex Event Processing for Mobile Ubiquitous Environments.* UbiComp'10; OPPORTUNITY Workshop, 2010.
- ▷ Doran, A., Mondet, S., Grigoras, R., Morin, G., Ooi, W. T., and Boudon, F.; *A demonstration of MobiTree: progressive 3D tree models streaming on mobile clients.* ACM Multimedia (Technical Demonstration), 2009.
- ▷ Mondet, S., Cheng, W., Morin, G., and Grigoras, R.; *On Streaming of Realistic 3D Models.* SinFra symposium, 2009.
- ▷ Mondet, S., Cheng, W., Morin, G., Grigoras, R., Boudon, F., and Ooi, W. T.; *Streaming of Plants in Distributed Virtual Environments.* 16th ACM international conference on Multimedia, 2008. **Best Paper Award**.
- ▷ Cheng, W., Ooi, W. T., Mondet, S., Morin, G., and Grigoras, R.; *An Analytical Model for Progressive Mesh Streaming*. 15th ACM international conference on Multimedia, 2007.

National Conferences
- ▷ Mondet, S., Boudon, F., Hoelt, J., Morin, G., Grigoras, R., Pradal, C., and Paulin, M.; *Compression progressive de modèles de plantes à base de cylindres généralisés.* AFIG, 2007 (*in French*).
- ▷ Mondet, S., Morin, G., and Grigoras, R.; *Optimized Box-Trees For Server-side Viewpoint Culling On Large 3D Scenes*. GTMG, 2007.
- ▷ Mondet, S., Morin, G., and Grigoras, R.; *Mise en ligne de modèles 3D echelonables basés points.* AFIG, 2005 (*in French*).

Research-related Activities

Reviewer for MM'09, NOSSDAV'10, ICME 2011, TOMCCAP, MMSJ, The Foundation for Polish Science.

Organisation team member for CORESA'09.

Education

2006 – 2009: Philosophiæ Doctor in Computer Science

"Adaptive Modeling and Distribution of Large Natural Scenes," University of Toulouse, France.

2002 – 2005: Engineering and Master's Degrees

ENSEEIHT (National Polytechnic Institute of Engineering in Electrotechnics, Electronics, Computer Science, Hydraulics and Telecommunications). Toulouse, France.

- ▷ Engineer in Computer Science and Applied Mathematics
- ▷ Research-oriented Master's degree on Software Safety and High-Performance Computing.

2000 – 2002: Undergraduate; "CPGE"

Preparatory classes for competitive entrance exams into national engineering schools; *speciality "Mathematics and Physics,"* CPGE Louis Barthou, Pau, France.

Skills

Programming Languages

OCaml, C, Unix Shells, Coq, Java, Ruby, C++, Python, Ada, SML, Perl, Fortran, Lisp, Prolog, VHDL, assemblers (68k, i386 and PIC).

Operating systems

GNU/Linux, OpenBSD, Android, Mac OSX, Solaris, MS Windows.

- ▷ Administration of a Linux-based development server during 3 years for more than 50 users: Subversion, DokuWiki, Redmine, and Git; with Apache2 (https), OpenLDAP …

Technologies

UML 2.0, SDL, HOOD, XML/CSS/XSLT, Data-Base systems, Real-time, CORBA, IP networks, Avionic networks, MANET routing, OpenGL (ES) rendering pipeline.

Tools

UNIX/POSIX tools, Coq, (La)TeX, Scilab/Matlab, SVN/Git.

Applied Mathematics

Geometric Modeling, Optimization, Hilbertian signal analysis, Fourier analysis, Optimal control, Graph theory, Partial differential equations, Bayesian classification.

Languages

French: native language.
Spanish: native language.
English: fluent.
German and Norwegian: basic knowledge.

Software Projects

Research-related

Promiwag is a code-generation library (for now) specialised in packet-parsing code. Promiwag generates C or OCaml code on which safety/security properties are *formally proved*.

- ▷ Objective Caml
- ▷ Uses Why and Alt-Ergo, for automatic formal proofs.

Wadis (*WAlk-through DIstant Scenes*) is an experimental testbed for Client-Server streaming of 3D scenes.

- ▷ Objective Caml, and C.
- ▷ Streaming over TCP, UDP, DCCP; uses OpenGL, Simple Direct-media Layer, GNU Triangulated Surfaces Library, 3DS Max file format.

LibGenCyl is a library for manipulating plants represented by Generalized Cylinders which provides efficient progressive (de)compression, and export/rendering.

- ▷ Pure OCaml, used by *Wadis*.
- ▷ Exports to SVG, VRML, OpenAlea and supports OpenGL rendering.

OMAN is a toolkit for traffic generation, measurements, and tunneling toolkit, for networking experiments.

- ▷ OCaml, and Bourne Shell.
- ▷ TCP, UDP and DCCP; provides an UDP tunneling system for DCCP on WAN experiments.

The Master Thesis's Project was a client-server system for streaming point-based 3D scenes.

- ▷ C++, Bash.
- ▷ HTTP (Apache with CGI), TCP and DCCP; Visualization client based on PointShop3D's render engine.

Personal – Open Source

Bracetax is a simple and deterministic text-processing syntax *(used for this CV)*.

- ▷ OCaml, MIT license, bracetax.berlios.de.

Sebib, *S-Expressions for Bibliography*, is a practical bibliography management system *(also used for this CV)*.

- ▷ OCaml, MIT license, sebib.forge.ocamlcore.org.

Yaboon is a set of reusable OCaml modules (*Yet Another Bunch Of OCaml Modules*).

- ▷ MIT license, yaboon.googlecode.com.

Personal Activities

Music

Classical, electric and bass guitar.
Have played in and/or initiated various bands, in various styles: *Rock*, *Hard rock*, *Funk*, *Electro-jazz*, and *Tribal Grind Core*.

Sports

Taekwondo (*3rd Keup*), Running, Cross-country skiing.

Hobbies

Juggling, Cinema, Literature.

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