Toni Sagristà Sellés – Software Engineer, Ph.D. in SciVis and Astronomy, M.Sc. in Astrophysics

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Professional Experience

→ **November 2013 – currently** **Astronomisches Rechen-Institut**, **Universität Heidelberg**

Gaia Sky Design, development and full release cycle of this real-time, 3D, astronomy visualisation software. Link to Gaia Sky homepage.

CU3/FL The Gaia First Look system performs initial daily diagnostics and analyses of the science data quality and consistency of the telemetry of Gaia.

CU9/WP960 Support for the scientific exploration of the Gaia data as well as its electronic publication. Support for the Gaia data visualisation and public outreach.

→ **May 2015 – May 2024** **Visual Computing Group**, IWR, **Universität Heidelberg**

Doctorate Doctoral candidate. Research in scientific visualization for astronomy and astrophysics.

HGS Member of HGS MathComp, my grad school (link).

→ **December 2011 – November 2013** **IEEC**/ICC/Universitat de Barcelona

Gaia ESA's mission Gaia is an astrometry satellite to observe ~1-2 billion stars.

GASS project Analysis, implementation and testing of the GAia Systems Simulator, which simulates the telemetry stream of Gaia. Also, profiling and optimisation of GASS using memory caches. Parallelization of code to get a speed-up of up to 60% in Marenostrum supercomputer.

TMV project Analysis, design and implementation of the TeleMetry Validator of GASS and Gaia using pure Java, Python, shell scripting and various plotting libraries.

Others Implementation of other pieces of software such as the GbinConverter, the IntervalUtils, the SkyPlotter or the HTMGenerator.

→ **February 2010 – December 2011** **Galaxy Formation Group**/ICC/Universitat de Barcelona

AMIGA Design and development of the AMIGA cosmological semi-analytic model front end for external use, under the supervision of Dr. E. Salvador. Use of GWT and development of own widgets and extensions.

Data module Design of the scientific data management module, a software layer dealing with huge amounts of cosmological data.

→ **September 2007 – January 2010** **Justinmind SL**

Gen. API Lead manager and analyst of HTML and web application generation API.

Usernote Design and development of Justinmind Usernote, the front end to the generation API.

Prototyper Design and development support to the Justinmind Prototyper team.

→ **October 2005 – January 2007** **Justinmind SL**

Document management	Design and development of a fully-featured document management system using Struts, Hibernate, Lucene and jBPM.
Justinmind incubator	Design and development of several products in their incubation stage, such as the Justinmind user management.
Generation core	Design and development of the application generation core in use in the Justinmind Usernote and Justinmind Prototyper.

Education

→ **May 2015 - May 2024** Ph.D. in Scientific Visualization and Astronomy (interdisciplinary)
Universität Heidelberg/Visual Computing Group (DE).
Visualization of Astrometric and Astrophysical Data (10.11588/heidok.00034797). Main topics: Vector Field Topology, unsteady flow visualization, inertial systems, scientific visualization, rendering, and computer graphics. Supervised by Prof. Dr. F. Sadlo and Prof. Dr. S. Jordan.

→ **February 2010 - September 2011** M.Sc. in Astrophysics, Particle Physics and Cosmology
Universitat de Barcelona/Department of Astronomy (ES). ISCED 6. Qualification: 90/100.
Awarded the *M.Sc. Honours Certificate* of the faculty of physics in 2011 for the my M.Sc. thesis, performed unde the supervision of Prof. Dr. E. Salvador.

→ **January 2007 - July 2007** Single Honours Project
University of Aberdeen/Computing Science Department (UK).
Project *Computer-aided catalan learning application*, founded on the grounds of Natural Language Processing (NLP) developed under the supervision of Dr. E. Reiter. Awarded with the qualification of *First Class Project*.

→ **September 2004 - June 2005** Erasmus year
University of Reading/School of Systems Engineering (UK).
E-business, Informatics for e-enterprise, Cybernetics and its applications, Commercial off-the-shelf software, Graphical user interfaces, Virtual reality.

→ **September 2001 - June 2007** B.Sc. in Informatics Engineering
Universitat Politècnica de Catalunya/FIB (ES). ISCED 6. Qualification RD 1044/2003: 1,937.
Some of the topics covered are HPC (High-performance computing), software engineering and information systems, fundamentals of computing, data management, system interfaces and integration, advanced programming techniques, telematic networks, operating systems, Engineering and engineering trades.

Technical Skills

Computer Graphics — OpenGL, GLSL, CUDA, OpenCL, Vulkan. Gaia Sky uses OpenGL/GLSL. Most projects in my Ph.D. are implemented in CUDA.

Java and J2EE — Expert in various J2EE technologies and frameworks. Gaia Sky uses Java for the CPU code.

- → *Application Servers* - Apache HTTP Server, Tomcat, Jetty.
- → *Frameworks* — LibGDX, LWJGL, Struts 1&2, Spring, JSF, WebWorks, GWT, Hibernate.
- → *Profiling* — Eclipse MAT, VisualVM, JProfile, JProbe, jmap, jhat, jstack.

Rust — LOD catalog generation for Gaia Sky, CHIP-8 emulator, and more.

Other languages — Other languages I know and use/used.

→ *C, C++* — Worked with both languages on various projects.

→ *Python* — Used extensively during my Ph.D. and in Gaia projects.

→ *Shell scripting* - bash, POSIX shell.

→ *FORTRAN* — Got to know FORTRAN well thanks to my work with the semi-analytic model AMIGA.

Scientific Visualization — The main topic of my Ph.D., involving Vector Field Topology, unsteady flow, inertial dynamics, visual analytics and more.

vim — My main development tool, aided with handy plugins.

IntelliJ IDEA — Current IDE of choice for Java. Used Eclipse in the past.

Databases — MySQL, PostgreSQL, IS Cache and domain-specific languages like ADQL.

HPC — Tuning and profiling code for its execution in the supercomputers at CESCA and BSC.

Android SDK — I have two apps published in F-Droid and Google Play (see my portfolio).

LaTeX — I use LaTeX to produce scientific papers, technical documentation and presentations.

Web tech. — Somewhat proficient in web technologies such as HTML5/CSS3, Javascript, PHP and others.

git/mercurial/svn — Knowledge of both centralized and distributed versioning systems.

NLP — 2007. Natural Language Processing knowledge, acquired developing the Honours Project in Aberdeen.

E-Business/Informatics for e-Enterprise — 2005. The University of Reading, Computer Science department.

Language skills

I can speak fluent **English** (TOEFL iBT 109/120 - 17 Dec 2011, CEFR C2 equivalent), **Spanish** and **Catalan**. I can communicate in German and have some background knowledge of French.

Publications and projects

The full up-to-date list of publications is available at tonisagrista.com/papers. Some of my projects are listed at tonisagrista.com/projects.

Social Skills and Competences

→ Teamworking. Ability to work in a multicultural environment.

→ Good communication and presentation skills in both English and Spanish.

→ Experience in software project management.

References

Available on request.

Last updated: September 18, 2024

https://tonisagrista.com/resume