Stefano Meschiari, Ph.D.

Researcher, Data Scientist, EdTech enthusiast in Austin, TX

PORTFOLIO	http://stefano-meschiari.github.io
GITHUB	http://github.com/stefano-meschiari
EMAIL	stefano.meschiari@gmail.com
PHONE	(408) 512-3834

I am an astrophysicist at the University of Texas at Austin. I work with all kinds of data: from understanding complicated time series that reveal the existence of new planetary systems with Bayesian modeling, to summarizing millions of game plays and behavior tracked within my game that went viral, to tracking the performance of students using the educational platform I lead.

I also use my programming skills to create software tools to support everyone's ability to understand and model data, from researchers to students at all levels.

EXPERIENCE

2012-PRESENT **W. J. MCDONALD POSTDOCTORAL FELLOW**
University of Texas at Austin

- I lead the data analysis effort for the Lick-Carnegie science collaboration (~20 scientists across the United States). I analyze time series data produced by large telescopes and search for the presence of new exoplanetary systems, leading to the discovery of several new planets. Each dataset is analyzed using my statistical code, Systemic, which models our observations using Markov-Chain Monte Carlo techniques; Systemic was used to discover more than 40 new planetary systems.
- I write high-performance, parallelized codes that solve ordinary and partial differential equations to model planet formation through numerical simulations.

2014-PRESENT **SAVE/POINT, PRINCIPAL INVESTIGATOR**
University of Texas at Austin

- I lead SAVE/Point, a collaboration of astronomers and educators producing cutting-edge edtech games, apps, and interactive touch kiosks, running on the latest Web technologies. I am the principal investigator and lead programmer and designer of the collaboration.
- We are funded through the Longhorn Innovation Fund for Technology, a grant that is competitively awarded to innovative academic technology projects that leverage information technology.
- I developed Super Planet Crash, an HTML5/JavaScript game that was played more than 15 million times and was covered by The Verge, IO9, Huffington Post, and others.
- I developed Systemic Live, an HTML5/JavaScript web t app that teaches students about the process of data analysis and scientific discovery. It is used in classes at Caltech, UF, UT, MIT, SJSU, UD, Yale, Columbia, UCSC, SFSU, Coursera, and others.

2010-2011
2013-2014 **RESEARCH ANALYST/CONTRACTOR**
VN7 Dynamic LP, EFFEX Capital

- At both companies, I led the development of a sophisticated desktop application to monitor the real-time performance of strategies on high-frequency stock trading. The package was used to aggregate statistics, steer strategies, and summarize high-frequency messages by a backend component.

EDUCATION

2012 **ASTROPHYSICS, PH.D.**
University of California at Santa Cruz
Won Whitford Prize award for best coursework and the Award for Excellence in Teaching.

2006 **ASTROPHYSICS, M.S. AND B.S.**
University of Bologna, highest honors

SKILLSET

OPEN-SOURCE

See my Github repository (http://github.com/stefano-meschiari) for a list of my open-source projects and materials. For a description of each project, see my portfolio (http://stefano-meschiari.github.io).

WEB TECHNOLOGIES
8 years

I use modern web technologies to power my educational apps & games, which run inside the browser (both on desktop and mobile). These web apps are widely used in the classroom and in interactive exhibits (Seattle Museum of Flight, Mt. Stromlo Observatory in Australia, University of Texas, and more). I also use it to publish interactive visualizations on the Web.

Extensive experience with JavaScript, HTML5, CSS/LESS, Apache Cordova, PostgreSQL and SQLite. Libraries used: Backbone.js, Paper.js, JQuery, Bootstrap, UIKit, and Node.js.

Example projects and libraries: SAVE/Point dashboard (education apps and games), Systemic Live (an online data analysis tool), When Giants Collide (a JavaScript library for computing gravity).

R
10 years

I use R for my data analysis tasks, numerical prototyping, plotting with ggplot2, and as a glue language to interface with C and Fortran libraries.
Example projects: Systemic2 (an IDE for astronomical data analysis), latex2exp (a package for using LaTeX in R), RVDB (an online data repository built using Shiny)

C
12 years

I write the time-consuming parts of my numerical algorithms in C, and parallelize them using OpenMP and MPI. I typically use a scripting language (R, Lua, or Python) as the "glue" that drives my C code or that analyzes the outputs.

Example projects: Systemic2 (a library collecting many data analysis algorithms), tinymcmc (a dependency-free implementation of MCMC)

JAVA
12 years

I have built large desktop applications in Java, including the Systemic2 user interface.

OTHER LANGUAGES

I have basic proficiency in Python, C++, Matlab, Fortran, and Clojure.

NUMERICAL METHODS
STATISTICS

Time series, model fitting and comparison, hypothesis testing and confidence intervals, Bootstrapped uncertainty estimation, Markov-Chain Monte Carlo, ODE and PDE integration. I am experienced in both creating sophisticated packages for data analysis from scratch when necessary, and connecting existing statistical libraries to create a complete product. I am experienced in obtaining data (from big telescopes to web scraping), cleaning it, and summarizing it.

RESEARCH

My scientific research focuses on discovering new exoplanets and understand how they formed. I published 18 peer-reviewed articles (8 of which are first-author), which have been cumulatively cited 627 times.