Matteo Tomasini

Research engineer

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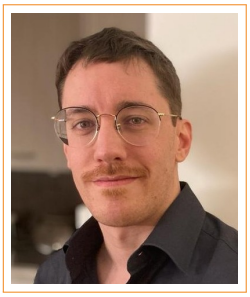

Summary

I am an enthusiastic research software engineer working in archaeology and digital humanities. My main interest is to support researchers in developing new computational tools, data pipelines and scientific visualizations. I have a keen eye for using the right methods for each problem at hand. My toolbox is suited for agent-based modelling, full-stack development, data analysis, statistical and mathematical modelling, and more. I am also involved in the dissemination of good programming practices in academia, as well as in the development of the careers of research software engineers in the Nordics.

Skills

Agent-based modelling, programming, (Python, R, C++, Matlab), I developed various population- and individual-based simulations to address questions in population genetics and climatology. I am active developer of a seafaring simulator.

Full-stack development, (Django, PostgreSQL; Vue; Sphinx), I contribute to the development, deployment and maintenance of the web platforms currently in use at my department.

Statistical analysis, (Python, R, Stan), I performed statistical analysis on simulations outputs and datasets using different methodologies, including Bayesian inference and machine learning. I further worked towards the development of a statistical method to extract information from genomic datasets. I also taught applied biostatistics to master students.

Scientific writing, (LaTeX, Word), I wrote several papers exposing the research results from my team, and published them in international peer-reviewed journals.

Leadership and management, I am the assigned manager for several projects involving scientific visualization. I also organize seminars and conferences for the Nordic RSE association. In the past, I led and managed the logistics of an artillery battery during military service in Switzerland.

Mathematical and numerical modelling, (Wolfram Mathematica), I worked on several mathematical models to study selected questions in population genetics and climatology.

Scientific dissemination, I contributed during 10 years to the growth of one of the largest Facebook pages about popular science in Italian.

Experience

Current employment

Nov 2022 – Present **Research engineer**, *Gothenburg Research Infrastructure in Digital Humanities, Göteborgs Universitet, Sweden*

I develop and maintain agent-based simulations to study seafaring in the Bronze Age. I am further involved in the development of research web platforms in digital humanities.

Feb 2023 – Present **Application expert**, *InfraVis, Sweden*

I develop and manage different products for external users within the Swedish national infrastructure for scientific visualization, InfraVis (30% employment).

Past employment

Mar 2021 – Oct 2022 **Postdoctoral research fellow**, *Department of Marine Sciences, Göteborgs Universitet, Sweden*
I modelled evolutionary mechanisms leading to the establishment of species' distributions in the Baltic Sea, using Python, C++ and Matlab.

Sep 2019 – Dec 2020 **Postdoctoral research associate**, *Department of Integrative Biology, Michigan State University, United States of America*
I worked on developing a Bayesian statistical method to harness genetic information for the inference of the demographic history of a species.

Feb 2015 – Jun 2019 **PhD student**, *Interfaculty Bioinformatics Unit, Universität Bern, Switzerland*
I developed mathematical models and simulations in Python to study the rapid adaptation of species at risk of extinction in a spatially structured model.

Teaching

Sep 2022 **Course co-leader**, *Software testing*, CodeRefinery
Co-teaching a course about automated testing during the yearly CodeRefinery workshop.

Sep 2017 – Jun 2019 **Substitute lecturer**, *Applied Biostatistics I and II*, Universität Bern
Substitution of main lecturer in case of absence.

Sep 2015 – Jun 2019 **Teaching assistant**, *Applied Biostatistics I and II*, Universität Bern
Management of exercise sessions and support for MSc students, correction of exercise sheets.

Sep 2015, 2016, 2017 and 2018 **Teaching assistant**, *Introduction to R*, Universität Bern
Teaching assistant during a 5 days introductory course to the R language.

Education

Feb 2015 – Jun 2019 **PhD studies in ecology & evolution**, *Universität Bern, Switzerland*, Supervisors: Dr. S. Peischl and Prof. L. Excoffier
Relevant courses and workshops: best practices in programming, introduction to Markov models, machine learning. Thesis topic: theoretical population genetics.

Sep 2012 – Oct 2014 **MSc in physics (orientation theoretical physics)**, *Université de Genève, Switzerland*
Thesis topic: theoretical climatology.

Sep 2009 – Aug 2012 **BSc in physics**, *Université de Genève, Switzerland*

Sep 2004 – Jun 2008 **Swiss Matura (classical curriculum)**, *Liceo di Locarno, Switzerland*
Relevant courses: ancient Greek, Latin.

Academic achievments and activities

Software and web applications

1. J. Westin, T. Bridge, **M. Tomasini**, *Etruscan Chamber Tombs*, v.1.0 GRIDH. https://etruscan.dh.gu.se/

Peer-reviewed publications

4. J. Westin, T. Bridge, **M. Tomasini** (2024), *From the Arctics to Antarctica – A multimodular visualisation of data*, Proceedings of the Huminfra Conference (HiC 2024), 135 – 140
3. **M. Tomasini**, S. Peischl, (2022), *The role of spatial structure in multi-deme models of evolutionary rescue*, Journal of Evolutionary Biology, 35(7), 986 – 1001
2. **M. Tomasini**, S. Peischl, (2020), *When does gene flow facilitate evolutionary rescue?*, Evolution, 74(8), 1640 – 1653
1. **M. Tomasini**, S. Peischl, (2018), *Establishment of locally adapted mutations under divergent selection*, Genetics, 209(3), 885 – 895

Submitted for publication

2a. J. Rieder, M. Jahnke, ..., **M. Tomasini**, F. A. M. Volckaert (2024), *Seascape genomics: assisting marine biodiversity management by combining genetic knowledge with environmental and ecological information*, EcoEvoRxiv, https://doi.org/10.32942/X2KW30

1a. **M. Tomasini**, M. Eriksson, K. Johannesson, M. Rafajlović (2022), *Shallow environmental gradients can cause range margins to form*, bioRxiv, https://doi.org/10.1101/2022.03.19.484973

Grants

9500 SEK (∼866€) Kungliga Vetenskaps- och Vitterhets-Samhället i Göteborg (KVVS) Stipendium 2022

750€ International Council for the Exploration of the Sea (ICES) Early Career Scientist funding, Baltic Sea Science Congress 2021

Rejected with Seal of Excellence *The evolution of marine species in continuous space*, Marie Skłodowska-Curie Actions – Individual Fellowship 2020, Evaluation Score: 90.40%

Selected oral contributions

Jan 2024 *From the Arctics to Antarctica – A multimodular visualisation of data*, Huminfra Conference, Gothenburg, Sweden

Oct 2022 *Fight or flight? The role of adaptation in shaping future species' distributions in light of climate change (featured session)*, YOUMARES 13, Berlin, Germany

Aug 2022 *How do species ranges respond to the effects of counteracting environmental gradients?*, European Society for Evolutionary Biology Congress 2022, Prague, Czech Republic

Oct 2021 *Range expansions along multiple environmental gradients*, Baltic Sea Science Congress 2021, Aarhus, Denmark

Jun 2019 *Effects of gene flow and fragmentation on evolutionary rescue*, Modelling Ecology & Evolution Zurich 2019, Zurich, Switzerland

Committees and academic roles

Aug 2024 – present Ambassador, CodeRefinery

Oct 2022 – present Board chair, Nordic Research Software Engineers association

Oct 2021 – Feb 2023 Steering committee, Linnaeus Centre for Marine Evolutionary Biology, University of Gothenburg

Memberships

May 2022 – present Nordic Research Software Engineers association

Apr 2021 – present Linnaeus Centre for Marine Evolutionary Biology, University of Gothenburg

Mar 2015 – Jul 2019 Swiss Institute of Bioinformatics

Unpaid research experience

Sep 2013 – Oct 2014 **MSc thesis**, *Effect of snow covering and ocean mixed layer on the irreversibility of sea ice retreat*, Institut des Sciences de l'Environnement, Université de Genève, Supervisors: Dr. M. Brunetti and Dr. S. Marshall

Feb 2012 **BSc short thesis**, *Measures of polarization of the solar light around the Balmer Jump*, Istituto Ricerche Solari Locarno and Université de Genève, Supervisors: Dr. M. Bianda and Dr. M. Audard

Miscellaneous

Languages

written / spoken	Italian	*Native language*
written / spoken	French	*Full professional working proficiency*
written / spoken	English	*Full professional working proficiency*
spoken	German	*Limited working proficiency*
written / spoken	Swedish	*Base proficiency (Nationella prov i SFI, kurs C)*

Other activities

Mar 2012 – Mar 2022 **Co-admin**, *Meccanica Quantistica: gruppo serio*

Co-administrator and moderator of the largest Facebook page of quantum physics dissemination in Italian language ($\sim$ 34'000 subscribers).

Aug 2009 – Apr 2019 **Battery Sergeant Major**, *Swiss Armed Forces*

I was responsible for logistics in an artillery battery – in particular personnel, equipment, ammunition, health service and barracks administration – during the yearly one month service.

Nov 2015 – Jun 2018 **Head of refereeing**, *Swiss Tchoukball*

Head of the refereeing commission and member of the executive committee of the Swiss federation of tchoukball; I developed refereeing in the sport as well as worked on referees' formation.

Leisure activities

Endurance sports	Regular practice of triathlon (2006–2020) and trail running (since 2021), with completion of several races up to half-ironman distance.
Visual astronomy	Regular practice of visual astronomy as well as astronomy sketching since 2023.
Music	Regular practice of piano playing since 1997; self-taught guitar player; I sang in 3 choirs between 2006 and 2015.