

# Matteo Tomasini

Research engineer

Gothenburg Research Infrastructure in Digital Humanities  
University of Gothenburg

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Citizenship: Switzerland

Birthdate: 1989-11-21



## Summary

I am an enthusiastic research software engineer working in 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

**Simulations, 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.js), 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.

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

**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 a unit during military service in Switzerland.

**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 (25% 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.

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## 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.

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## Academic achievements 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

- 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

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### Miscellaneous

#### Languages

written / spoken Italian

Native language

written / spoken	French	<i>Full professional working proficiency</i>
written / spoken	English	<i>Full professional working proficiency</i>
spoken	German	<i>Limited working proficiency</i>
written / spoken	Swedish	<i>Base proficiency (Nationella prov i SFI, kurs C)</i>

### 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 (~ 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.