

# Matteo Tomasini

Research Engineer at Gothenburg Research Infrastructure in Digital Humanities     University of Gothenburg, Sweden

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## Summary

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I am an enthusiastic research software engineer working in archaeology and digital humanities. In my employment I support researchers in the humanities in developing new computational tools, data pipelines and scientific visualizations. Additionally, I pursue my own research focusing on ancient navigation and on mechanisms of cultural transmission. I have a keen eye for using the right methods for each problem at hand. My toolbox is suited for agent-based modelling, back end 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

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### Agent-based modelling

Python

- I am actively developing and maintaining an ABM seafaring simulator.
- I developed various population- and individual-based simulations to address questions in cultural evolution, population genetics and climatology.

### Research software development

Python, R, C++, Matlab; git

- I apply best practices to the development of the software I used for my research.
- I have experience with versioning, testing, documentation, and other processes in software engineering and development.

### Statistical analysis

Python, R, Stan

- I performed statistical analysis on simulations outputs and datasets using different methodologies, including Bayesian inference and machine learning.
- I worked towards the development of a statistical method to extract information from genomic datasets.

### Mathematical and numerical modelling

Wolfram Mathematica

- I worked on several mathematical models to study selected questions in population genetics and climatology.

### Full-stack development

Django, PostgreSQL, REST; Vue; Sphinx

- I contribute to the development, deployment and maintenance of the backend for web platforms currently in use at my department.
- I contribute to the maintenance of the frontend for web platforms currently in use at my department.

### 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 organize seminars and conferences for the Nordic RSE association.
- I led and managed the logistics of an artillery battery during military service in Switzerland.

### Scientific dissemination

- I regularly animated a booth at public outreach events in my current department, such as the local “Vetenskaps-

festivalen” (science festival in Gothenburg).

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

## Experience

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<b>Gothenburg Research Infrastructure in Digital Humanities, Göteborgs Universitet,</b> Research Engineer	Gothenburg, Sweden Nov 2022 – Present
<ul style="list-style-type: none"><li>• I develop agent-based simulations to study seafaring in the Bronze Age.</li><li>• I am involved in the development of research web platforms in digital humanities.</li><li>• I co-manage operations within my department.</li></ul>	
<b>InfraVis,</b> Application Expert (10% employment)	Gothenburg, Sweden Feb 2023 - Present
<ul style="list-style-type: none"><li>• I develop and manage different products for external users within the Swedish national infrastructure for scientific visualization.</li></ul>	
<b>Department of Marine Sciences, Göteborgs Universitet,</b> Postdoctoral research fellow	Gothenburg, Sweden Mar 2021 - Oct 2022
<ul style="list-style-type: none"><li>• I modelled evolutionary mechanisms leading to the establishment of species' distributions in the Baltic Sea, using Python, C++ and Matlab.</li></ul>	
<b>Department of Integrative Biology, Michigan State University,</b> Postdoctoral research associate	East Lansing, MI, USA Sep 2019 - Dec 2020
<ul style="list-style-type: none"><li>• I worked on developing a Bayesian statistical method to harness genetic information for the inference of the demographic history of a species.</li></ul>	
<b>Interfaculty Bioinformatics Unit, Universität Bern,</b> PhD student	Bern, Switzerland Mar 2015 - Jul 2019
<ul style="list-style-type: none"><li>• I developed mathematical models and simulations in Python to study the rapid adaptation of species at risk of extinction in a spatially structured model.</li><li>• I taught biostatistics to student at the master level (as teaching assistant and substitute lecturer).</li></ul>	

## Teaching experience

<b>Basics of R and visualization in R,</b> Course leader	InfraVis Sep 2022
<ul style="list-style-type: none"><li>• Internal course to InfraVis application experts to introduce them to R and using visualization tools in R (including tidyverse and ggplot2).</li></ul>	
<b>Software testing,</b> Course co-leader	CoreRefinery Sep 2022
<ul style="list-style-type: none"><li>• Co-teaching a course about automated testing during the yearly CodeRefinery workshop.</li></ul>	
<b>Applied Biostatistics I and II,</b> Substitute lecturer	Universität Bern Sep 2017 - Jun 2019
<ul style="list-style-type: none"><li>• Substitution of main lecturer in case of absence.</li></ul>	
<b>Applied Biostatistics I and II,</b> Teaching Assistant	Universität Bern Sep 2015 - Jun 2019
<ul style="list-style-type: none"><li>• Management of exercise sessions and support for MSc students, correction of exercise sheets.</li></ul>	
<b>Introduction to R,</b> Teaching Assistant	Universität Bern Sep 2015, 2016, 2017, 2018
<ul style="list-style-type: none"><li>• Teaching assistant during a 5 days introductory course to the R language.</li></ul>	

## Education

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<b>PhD</b> <b>Universität Bern,</b> Ecology and Evolution	Mar 2015 – Jun 2019
<ul style="list-style-type: none"><li>• <b>Thesis topic:</b> theoretical population genetics</li><li>• <b>Supervisors:</b> Dr. S. Peischl and Prof. L. Excoffier</li><li>• <b>Relevant coursework:</b> Best Practices in Programming, Introduction to Markov Models, Machine Learning</li></ul>	

<b>MSc</b>	<b>Université de Genève</b> , Physics (orientation: theoretical physics) • <b>Thesis topic:</b> theoretical climatology	Sep 2012 – Oct 2014
<b>BSc</b>	<b>Université de Genève</b> , Physics <b>Liceo di Locarno</b> , Swiss Matura Exam (classical curriculum) • <b>Relevant coursework:</b> ancient Greek, Latin.	Sep 2009 – Aug 2012 Sep 2012 – Oct 2014



## Academic achievements and activities

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### Peer-reviewed publications

- J. Rieder, M. Jahnke, ..., **M. Tomasini**, F. A. M. Volckaert (*in press*), *Seascape genomics: assisting marine biodiversity management by combining genetic knowledge with environmental and ecological information*, Marine Policy
- B. Bengtsson, A. Montenegro, A. Green, **M. Tomasini**, M. Prince, V. Wåhlstrand Skärström, K. I. Austvoll, J. Ling, C. Lindhé (2025), *Seafaring and navigation in the Nordic Bronze Age: The application of an ocean voyage tool and boat performance data for comparing direct open water crossings with sheltered coastal routes*. PLOS One. [10.1371/journal.pone.0320791](https://doi.org/10.1371/journal.pone.0320791) 
- 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. [10.3384/ecp205018](https://doi.org/10.3384/ecp205018) 
- 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. [10.1111/jeb.14018](https://doi.org/10.1111/jeb.14018) 
- M. Tomasini**, S. Peischl (2020), *When does gene flow facilitate evolutionary rescue?*, Evolution, 74(8), 1640 – 1653. [10.1111/evo.14038](https://doi.org/10.1111/evo.14038) 
- M. Tomasini**, S. Peischl (2018), *Establishment of locally adapted mutations under divergent selection*, Genetics, 209(3), 885 – 895. [10.1534/genetics.118.301104](https://doi.org/10.1534/genetics.118.301104) 

### Software and web applications

- J. Westin, T. Bridge, **M. Tomasini** (2025), *Etruscan Chamber Tombs* (Version 1.0) [Web portal]. <https://etruscan.dh.gu.se/> 
- J. Westin, T. Bridge, **M. Tomasini**, A. Green, A. Karimi (2024), *Saint Sophia's Inscriptions* (Version 1.3.0) [Web portal]. <https://saintsophia.dh.gu.se/> 

### Pre-prints

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

### Grants

Kungliga Vetenskaps- och Vitterhets-Samhället i Göteborg (KVVS) Stipendium 2022	9500 SEK (~866€)
International Council for the Exploration of the Sea (ICES) Early Career Scientist funding, Baltic Sea Science Congress 2021	750€
Marie Skłodowska-Curie Actions – Individual Fellowship 2020, <i>The evolution of marine species in continuous space</i> , Evaluation Score: 90.40%	Seal of Excellence

### Selected oral contributions

<b>Pytheas: a fast and agile ABM software for the study of ancient seafaring</b> , CAA International Conference 2025, Athens, Greece (with A. Montenegro, B. Bengtsson)	May 2025
<b>What can metapopulation models say about maritime connectivity in ancient times?</b> , Kiel Conference 2025, Kiel, Germany (with M. Vander Linden)	Mar 2025
Session: <b>Evolution.</b> , Theoretical Archaeology Group 2024, Bournemouth, United Kingdom (with M. Vander Linden, E. Crema)	Dec 2024

<b>From the Arctics to Antarctica – A multimodular visualisation of data</b> , Huminfra Conference, Gothenburg, Sweden (with T. Bridge, J. Westin)	Jan 2024
Featured session: <b>Fight or flight? The role of adaptation in shaping future species' distributions in light of climate change</b> , YOUMARES 13, Berlin, Germany (with M. Eriksson)	Oct 2022
<b>How do species ranges respond to the effects of counteracting environmental gradients?</b> , European Society for Evolutionary Biology Congress 2022, Prague, Czech Republic (with M. Rafajlović, M. Eriksson, K. Johannesson)	Aug 2022
<b>Range expansions along multiple environmental gradients</b> , Baltic Sea Science Congress 2021, Aarhus, Denmark (with M. Rafajlović)	Oct 2021

## Conference organization

<b>Local organizing chair</b> , Nordic-RSE 2025 Conference at University of Gothenburg, Gothenburg, Sweden	May 2025
<b>Chair of organizing committee</b> , Nordic-RSE 2024 Conference at Aalto University, Espoo, Finland	May 2024

## Committees and other appointments

<b>Representative</b> , International Council of RSE Associations	Jun 2025 - Present
<b>Advocate</b> , Dark Sky International	Jan 2025 - Present
<b>Ambassador</b> , CodeRefinery	Aug 2024 - Present
<b>Board chair</b> , Nordic-RSE	Oct 2023 - Present
<b>Board member</b> , Nordic-RSE	Oct 2022 - Sep 2023
<b>Steering committee member</b> , Linnaeus Centre for Marine Evolutionary Biology, University of Gothenburg	Oct 2021 - Feb 2023

## Memberships

Computer Applications and Quantitative Methods in Archaeology (CAA)	Mar 2025 - Present
Dark Sky International	Jan 2025 - Present
Nordic RSE (Research Software Engineers association)	May 2022 - Present
Linnaeus Centre for Marine Evolutionary Biology, University of Gothenburg	Apr 2021 - Apr 2025
Swiss Institute of Bioinformatics	Mar 2015 - Jul 2019

## Unpaid research experience

<b>MSc thesis</b> , Institut des Sciences de l'Environnement, Université de Genève <ul style="list-style-type: none"> <li>• <b>Thesis:</b> Effect of snow covering and ocean mixed layer on the irreversibility of sea ice retreat</li> <li>• <b>Supervisors:</b> Dr. M. Brunetti and Dr. S. Marshall</li> </ul>	Sep 2013 – Oct 2014
<b>BSc short thesis</b> , Istituto Ricerche Solari Locarno and Département d'Astronomie de l'Université de Genève <ul style="list-style-type: none"> <li>• <b>Thesis:</b> Measures of polarization of the solar light around the Balmer Jump</li> <li>• <b>Supervisors:</b> Dr. M. Bianda and Dr. M. Audard</li> </ul>	Feb 2012

## Miscellaneous

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### Languages

<b>Italian</b> (Native language)	written / spoken
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<b>French</b> (Bilingual proficiency)	written / spoken
<b>English</b> (Full professional working proficiency)	written / spoken
<b>Swedish</b> (Limited working proficiency)	written / spoken
<b>German</b> (Limited working proficiency)	spoken
<b>Spanish</b> (Base proficiency)	spoken

## Other activities

<b>Co-admin</b> , <i>Meccanica Quantistica: gruppo serio</i> <ul style="list-style-type: none"> <li>Co-administrator and moderator of the largest Facebook page of quantum physics dissemination in Italian language (~ 34'000 subscribers).</li> </ul>	Mar 2012 – Mar 2022
<b>Battery Sergeant Major</b> , <i>Swiss Armed Forces</i> <ul style="list-style-type: none"> <li>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.</li> </ul>	Aug 2009 - Apr 2019
<b>Head of refereeing</b> , <i>Swiss Tchoukball</i> <ul style="list-style-type: none"> <li>Head of the refereeing commission and member of the executive committee of the Swiss federation of tchoukball.</li> <li>I developed refereeing in the sport as well as worked on referees' formation.</li> <li>International tchoukball referee; highest honor was refereeing the European Championship finals in 2016.</li> </ul>	Nov 2015 - Jun 2018

## Leisure activities

### Endurance sports

- Regular practice of triathlon (2006–2020) and trail running (since 2021)
- I completed several races up to the Ironman 70.3 distance and 30 km trail run.

### Visual astronomy

- Regular practice of visual astronomy as well as astronomical sketching.