

# MORENO ZOLFO

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## RESEARCH INTERESTS

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I am an enthusiast young researcher fascinated by bioinformatics, computational biology, metagenomics and viromes research. I am working in the development of computational solutions to address biologically relevant challenges. I am also interested in microbiome research, specifically oriented to human-associated viral communities. My current research focuses on the characterization of bacteriophages in the human microbiome.

## WORK EXPERIENCE

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Current position

### **Ph.D. Candidate | Biomolecular Sciences**

*Centre for Integrative Biology (CIBIO) – University of Trento*

I am a PhD candidate at the Laboratory of Computational Metagenomics (P.I. **Prof. Nicola Segata**). My project is focused on the metagenomics-based characterization and discovery of viruses from human microbiomes.

2014 - 2016

### **Student Internship | Laboratory of Computational Metagenomics**

*Centre for Integrative Biology (CIBIO) – University of Trento*

During my internship and thesis, I worked on the development of computational methods for microbial identification and tracking from metagenomics data. I developed MetaMLST, a software enabling *in silico* MLST-analysis without the need for cultivation.

**SUPERVISOR** | Prof. Nicola Segata

**AREAS** | Python, problem solving, scientific programming and bioinformatics

2015 May-Sep

### **iGEM Team Member | CIBIO, University of Trento**

With the project "*Solar pMFC: a microbial fuel cell with a light driven Escherichia coli engine*", we aimed to produce electricity through a genetically modified *E. coli* strain. We presented our project at the 2015 **International Genetic Engineering Competition** in Boston (MA), and were nominated for the "Best Project in the Energy Track" award.

**SUPERVISOR** | Prof. Sheref Mansy, Dr. Cristina del Bianco Prof. Olivier Jousson

**AREAS** | Bioinformatics, Computational Genomics, Web Development

- 2012 - 2013      **Software Analyst and Developer | G.E.C. SpA**  
*Gestione Esazioni Convenzionate – Cuneo (Italy)*  
 Junior backend programmer for G.E.C. SpA, a tax-collection company. As a member of the ICT office, I developed software to handle the production, calculation and availability of taxes data, invoices and payment solutions. I worked in PHP and SQL.  
 SUPERVISOR | Maurizio Nannini
- 2010 Sep-Dec      **Instructor | City of Roccavione – Cuneo (Italy)**  
 Teaching activity for a basic computer-usage course for two 25 people classes of elderly people with little or no experience in the field (40 hours)
- 2009 Oct-Feb      **Instructor | Istituto Tecnico Industriale “M. Delpozzo” – Cuneo (Italy)**  
 Basic Linux: *fundamentals of the most popular Open Source Operating System. A hands-on Linux* course from GUI to Bash (35 hours)
- 2009 Jun-Aug      **Intern | G.E.C. SpA**  
*Gestione Esazioni Convenzionate – Cuneo (Italy)*  
 Analysis, development and deployment of a web-based intranet web-application suite.  
 SUPERVISOR | Maurizio Nannini
- 2008 Jul-Aug      **Intern | City of Cuneo – Data Elaboration Bureau – Cuneo (Italy)**  
 Development of on-LAN client-server software for the City’s Central Library.  
 SUPERVISOR | Corrado Ambrogio

## EDUCATION

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- 2014 - 2016      M.Sc. in **CELLULAR AND MOLECULAR BIOTECHNOLOGY – 110** / 110 with honours  
*Centre for Integrative Biology (CIBIO), University of Trento, Italy*  
 [2 years program, taught in English]  
**Merit Scholarship** awarded by the University of Trento (2016)  
**Thesis:** Identification, Discovery and Characterisation of Viruses in the Human Microbiome  
 ADVISOR | Prof. Nicola Segata
- 2010 - 2014      B.Sc. in **COMPUTER SCIENCE – 101** / 110  
*Department of Engineering and Information Science (DISI), University of Trento, Italy*  
 Interdisciplinary programme in **COMPUTATIONAL BIOLOGY**  
**Merit Scholarship** awarded by the University of Trento (2014)  
**Thesis:** A computational metagenomic pipeline for cultivation-free bacterial strain typing  
 ADVISOR | Prof. Enrico Blanzieri
- 2005 - 2010  
 100      High School Diploma: **INDUSTRIAL TECHNICIAN, COMPUTER SPECIALIST – 100** / 100  
*Istituto Tecnico Industriale “M. Delpozzo” – Cuneo, Italy*  
**Final Project:** A real-time end-to-end cryptography system with dsPIC microcontrollers  
**Merit Scholarships:** Young Piedmontese Excellences (2009), Masante Merit Prize (2008)  
**Other activities:** Students Representative (2007-2010)

## PUBLICATIONS

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- 2018 Ferretti, P. *et al.* **Mother-to-Infant Microbial Transmission from Different Body Sites Shapes the Developing Infant Gut Microbiome.** *Cell host & microbe*, 24(1), pp.133–145.e5.
- 2018 Zolfo, M. *et al.* **Profiling microbial strains in urban environments using metagenomic sequencing data.** *Biology direct*, 13(1), p.9.
- 2017 Tett, A. *et al.* **Unexplored diversity and strain-level structure of the skin microbiome associated with psoriasis.** *npj Biofilms and Microbiomes*, 3(1), p.14.
- 2017 Duranti, S. *et al.* **Maternal inheritance of bifidobacterial communities and bifidophages in infants through vertical transmission.** *Microbiome*, 5(1), p.66.
- 2017 Asnicar, F. *et al.* **Studying Vertical Microbiome Transmission from Mothers to Infants by Strain-Level Metagenomic Profiling** *mSystems*, 2(1), pp.e00164–16.
- 2016 Zolfo, M. *et al.* **MetaMLST: multi-locus strain-level bacterial typing from metagenomic samples.** *Nucleic acids research*, p.gkw837.
- 2016 Donati, C. *et al.*, 2016. **Uncovering oral Neisseria tropism and persistence using metagenomic sequencing.** *Nature Microbiology*, 1(May), p.16070.
- 2016 Ward, D.V. *et al.* **Metagenomic Sequencing with Strain-Level Resolution Implicates Uropathogenic *E. coli* in Necrotizing Enterocolitis and Mortality in Preterm Infants.** *Cell reports*, 14(12), pp.2912–2924.
- 2016 Scholz, M. *et al.* **Strain-level microbial epidemiology and population genomics from shotgun metagenomics.** *Nature methods*. doi:10.1038/nmeth.3802

## AWARDS AND CONFERENCES

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- 2017 **CAMDA Travel Fellowship & Outstanding Presentation Award at ISMB/ECCB**  
Talk: Strain-level bacterial and viral diversity in the MetaSUB dataset [Prague, CZ]
- 2015 **iGEM 2015 Gold Medal**  
For the fulfillment of the prescribed gold requirements in the iGEM competition. Additionally, our project was nominated among the top three projects of the Energy Track. [Boston, MA]
- 2015 **European Science Foundation Travel Award**  
Short talk and poster at Symbiomes: Systems Biology of Host-Microbes [Pultusk, PL]

## LANGUAGES

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Italian	Native speaker
English	Professional working proficiency, oral and written 2006 – <i>Semi-Intensive English</i>   <i>Concorde International School, Canterbury (UK)</i> 2007 – <i>Semi-Intensive English</i>   <i>EAC language center, Edinburgh (UK)</i> 2009 – <i>Cambridge P.E.T. Exam</i> – <b>98</b> / 100
French	Limited working proficiency
Japanese	Elementary proficiency

## COMPUTER SKILLS

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Languages	Python, C/C++/mikroC, PHP, Bash, SQL, Java, Javascript, JQuery, HTML 5, Assembly (Intel / AT&T, Microchip), Visual Basic .NET, R, O'CamI, R
Software skills	Experience with Linux and Windows OS. Everyday use of various Bioinformatics Software I love to experience with new software packages.

## OTHER SKILLS

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Basic **molecular biology-lab training** acquired as part of my B.Sc. and M.Sc.

Good social and Team-Leading skills acquired in the following roles:

- Vice President of two NPOs: "RagionevolMente" (since 2015) and "Parole con le Ali" (2010-2013)
- Students Representative at the Centre for Integrative Biology, University of Trento (2015)
- Team Leader of a small group for the development of an app for Trento's Science Museum (2013)
- Administrator of an online role-playing community, counting more than 50 people (since 2013)

## OTHER ACTIVITIES

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2015 - Present	<b>Vice President</b>   Non-Profit Organization "RagionevolMente"  I am a co-founder of RagionevolMente: a small non-profit organization active in scientific communication. RagionevolMente's mission is to promote the communication of science and to foster the access to scientific information, from the lab to the people.
2014 - Present	<b>Assistant Organizer</b>   TEDx Trento  I am a volunteer at TEDx Trento, a conference held yearly that aims to spread ideas, experiences, advances in research, examples of scientific creativity, social activism and non-conventional thinking. I currently manage ticketing and customer assistance.
2013 - Present	<b>Administrator and Lead Programmer</b>   Star Trek Federation RPG  I developed and manage the software platform of an online gaming community
2015 - 2016	<b>Students Representative</b>   CIBIO, University of Trento
2010 - 2013	<b>Vice President</b>   Non-Profit Organization "Parole con le Ali" – Cuneo  "Parole con le Ali" was a non-profit organization promoting the connection between schools and workplaces with training projects and workshops in schools.