Desiree **MANICARDI**

PhD in "Computer Science and Computational Mathematics"

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Year of Birth: 1994
Updated on 2025/03/16

Education

from 11/2020 to 05/2024
Ph.D. Degree in "Computer Science and Computational Mathematics", *University of Insubria*, Como, Italy

- Thesis: "**Formal Models for Biological Systems**" (in English).
- I focused my research on *formal models for biological systems*. I started modelling some interesting biological systems such as the Heart system via CospanSpan(Graph), which is a compositional model having *mathematical rigor* and tailored for modelling *large systems*. Then, I worked on a model to formalise a process algebra. It is user-friendly, easy to implement, and tailored for modelling *biochemical reaction networks*.
- Camp: "Innovation Camp for PhD Students – Deep Dive Into Innovation and Execution" (03-05/2021).
- Research interests:
  - Formalisms for biological systems.
  - Timing formalisms.
  - Categories.
  - Probability.
- Public Ph.D. Scholarship for the best 6 Ph.D. applications for the XXXVI Ph.D. Cycle at the "Computer Science and Computational Science" Ph.D. course, Theoretical and Applied Sciences Department of University of Insubria, October 2020.
- Attended courses:
  - *Advanced Topics in Cryptography*;
  - *Bioinformatics*;
  - *Computational Cognitive Modeling*;
  - *Early design of Internet of Things networks towards real deployment*;
  - *Graph Labelings, Colorings and Their Applications*;
  - *Modeling and Verifying Hybrid Systems*;
  - *Systems, Modelling & Simulations*;
  - *Technologies for processing streaming data pipeline*.

from 12/2016 to 07/2018
Master Degree in "Computer Science", *University of Insubria*, Varese, Italy, *110/110 cum laude*

- Thesis: "**Modellazione di un Pacemaker Dual Chamber in Span(Graph)**" (in Italian) – Modeling a Dual Chamber Pacemaker in Span(Graph).
- Main courses: Software Engineering, Requirements Engineering, Programming in Java and C, Models of Computation, Models for Biological Systems, Privacy and Security, Artificial Intelligence.
- Six projects.
- Two scholarships.

from 09/2013 to 12/2016 **Bachelor Degree in "Computer Science"**, *University of Insubria*, Varese, Italy, *101/110*
- ○ Thesis: "**Progettazione e sviluppo di un'applicazione per il filtraggio di messaggi di Twitter**" (in Italian) – Design and development of an application for filtering Twitter messages.
- ○ Main courses: Database, Privacy and Security, Coding theory, Programming in Java, Software Design, Web applications.
- ○ Seven projects.
- ○ One scholarship.

Research Experience

from 03/2024 to 02/2025 **Recognised Researcher ("Assegnista di Ricerca")**, *University of Insubria*, Como, Italy
- ○ Research Title: "Specifica e analisi delle differenze comportamentali nei sistemi biomedici".
- ○ Project: "MEDICA: Modelling and vErification of alkaptonuria and multiple sclerosis Driven by biomedICAl data" ("MEDICA: Modellazione e verifica dell'alcaptonuria e della sclerosi multipla guidate dai dati").
- ○ See the website *here*.

Projects

As a *Recognised Researcher* ("Assegnista di Ricerca")

from 03/2024 to 02/2025 *Modelling and vErification of alkaptonuria and multiple sclerosis Driven by biomedICAl data* (MEDICA), financed by MIUR-PRIN 2022.
- ○ Four universities: University of Pisa, University of Turin, University of Siena and University of Insubria.
- ○ See the website *here*.

Computer Science Experience

from 11/2017 to 05/2018 **Traineeship**, *University of Insubria*, Como, Italy
Analysis of the Span-Cospan(Graph) formalism, focusing on timing.
Using Span(Graph) and (timing) Cospan(Graph) formalisms.

from 02/2016 to 09/2016 **Traineeship**, *University of Insubria*, Varese, Italy
Design and development of a web application aimed at filtering tweets using Twitter API.
Using OAuth, API REST, Twitter API, PHP, CSS, Putty.

Publications

[1] Valentina Castiglioni, Ruggero Lanotte, Michele Loreti, Desiree Manicardi, and Simone Tini. Robustness for biochemical networks: Step-by-step approach. *Theoretical Computer Science*, page 114934, 2024.

[2] Alessandro Gianola, Stefano Kasangian, Desiree Manicardi, Nicoletta Sabadini, Filippo Schiavio, and Simone Tini. Cospanspan(graph): A compositional description of the heart system. *FUNDAMENTA INFORMATICAE*, 171:221–237, 2019.

[3] Alessandro Gianola, Stefano Kasangian, Desiree Manicardi, Nicoletta Sabadini, and Simone Tini. Compositional modeling of biological systems in cospanspan (graph)(extended version). Technical report, Technical report, https://gianola. people. unibz. it, 2020.

[4] Alessandro Gianola, Stefano Kasangian, Desiree Manicardi, Nicoletta Sabadini, and Simone Tini. Compositional modeling of biological systems in cospanspan(graph). In *CEUR Workshop Proceedings*, volume 2756, pages 61–66. CEUR-WS, 2020.

[5] Ruggero Lanotte, Desiree Manicardi, and Simone Tini. Step-by-step robustness for biochemical networks. volume 3587, page 299 – 313, 2023.

[6] Desiree Manicardi. Formal models for biological systems. 2024.

Conferences

○ Conference Presentation: "Step-by-step Robustness for Biochemical Networks", Italian Conference on Theoretical Computer Science 2023 (Palermo, Italy, September 13-15, 2023).

○ Conference Presentation: D. Manicardi and N. Sabadini, "Cospan/Span(Graph): an algebra for open, reconfigurable automata networks.", Workshop in honour of R. F. C. Walters (Tallinn, Estonia, July 17-18, 2023).

○ Conference Presentation: D. Manicardi, N. Sabadini and S. Tini, "Automata and intelligent agents", NeuroSpine, V International Meeting (online, November 16, 2020).

○ Poster: A. Gianola, S. Kasangian, D. Manicardi and N. Sabadini, "A Compositional Model of the Heart-Pacemaker System in CospanSpan(Graph)", Workshop iHeart, 2019 RISM Congress: Modelling the Cardiac Function, (Varese, Italy, July 22-24, 2019).

Computer Skills [selected]

Strenghts

Database	SQL	*During my university studies, I did two projects and the Bachelor thesis using SQL.*
	NoSQL	*During my university studies, I did two projects using NoSQL.*

Programming	Java	*I have been studying this language since 2013.*
		During my university studies, I did six projects using Java.
		I tutored this language at the University of Insubria during the A.Y. 2020-2021 and 2021-2022.
	Python	*I have been using Python for my research since 2020.*
		During the A.Y. 2020-2021, I was an adjunct professor in this language at the University of Turin.
	Object-Oriented Programming	

Intermediate

Backend	Node.js
Database	MySQL, MongoDB, PostgreSQL
	Normalization
Diagrams	UML, ER
Environment	Eclipse
OS	Windows
Programming	C, C++, C#
	Parallel, distributed and concurrent programming
Tools	pgAdmin, Node-RED
Web	HTML, CSS, JavaScript, JQuery *I manage a personal website since December 2023.*
	PHP, JSON
	AJAX
	Single-page applications, static applications
	WordPress *From January 2013 to February 2021, I managed a blog where I put motivational quotes.*

Basic

Code Testing		*I have not already worked with specific code testing framework, such as Jest, but I studied code testing principles during the Master.*
Database	Hippocratic Databases	
Diagrams	Kaos, Problem Frames	
Model	Client-Server	
Network management	Putty	*I used it for my Bachelor thesis*
OS	Linux	
Platform	GitHub	
Programming	Real-time programming	
	API REST	*I used Twitter API for my Bachelor thesis*
Security	OAuth	*I used it for my Bachelor thesis*
Web	ASP	*I studied it in the High School.*
Software	Gephi	

Certifications

Computer Science	**Google digital training - Fondamenti di marketing digitale**, *Google*, 06/2020
	Técnicas Cuantitativas y Cualitativas para la Investigación, *EdX, Universidad Politécnica de Valencia*, 01/2019
	Data Access in C# and .NET Core, *EdX, Microsoft*, 09/2018
	Asynchronous Programming with Javascript, *EdX, Microsoft*, 08/2018
	Introduction to Python: Absolute Beginner, *EdX, Microsoft*, 08/2018
	Architetture orientate ai servizi, *University of Insubria*, 06/2018
	Sistemi organizzativi a rete, *University of Insubria*, 06/2018
Mathematics	**IGCSE Mathematics Extended**, *University of Cambridge*, 06/2013
	IGCSE Mathematics Core, *University of Cambridge*, 06/2012

Experience

Teaching activities - Didactic support (in Italian)

A.Y. 2021-22 **Tutor for the course "Programmazione"**, *University of Insubria*, Como, Italy
Programming language: *Java*.

A.Y. 2020-21 **Adjunct Professor for the course "Software Python"**, *University of Turin*, Turin, Italy
In Italian: *Professoressa Universitaria a Contratto*.
The course was configured as supplementary teaching of the "Methods of simulation for statistics" course – Department of Economics and Statistics "Cognetti de Martiis", Master in "Statistical and Economic Methods for Decisions" (Corso di Laurea Magistrale in "Metodi statistici ed economici per le decisioni").
Programming language: *Python*.
See the program *here*.

A.Y. 2020-21 **Assistant for the course "Programmazione"**, *University of Insubria*, Como, Italy
Programming language: *Java*.

S.Y. 2020-21 **Tutor for the course "Le Basi della Scienza dei Dati"**, *"I Lincei per la Scuola" Foundation*, Milan, Italy

A.Y. 2019-20 **Assistant for the course "Le Basi della Scienza dei Dati"**, *University of Milan-Bicocca*, Milan, Italy

S.Y. 2012-13   **Tutor for the course "Nonni su Internet"**, *Istituto Tecnico Economico Enrico Tosi*, Busto Arsizio, Italy
Software: *Microsoft Office Word.*
Surfing the Internet.

Miscellaneous

from 12/2018   **Administrative employee**, *Comune di Olgiate Olona*, Olgiate Olona, Italy
to 12/2019

from 07/2012   **Administrative Traineeship**, *Comune di Olgiate Olona*, Olgiate Olona, Italy
to 08/2012

Languages

Italian   Native

English   Fluent   *First Certificate in English (CEFR Level B2, 03/2023), I co-wrote papers in English – see the Publications section.*

Extra

○ Registered in the *Albo dei soggetti accreditati*, University of Milan-Bicocca (2020 – 2021)

Hobbies

Cooking   I have been cooking as much time as possible since I was in middle school.

Crochet   Last year, I started crocheting.

Genealogy Tree   I found the information of an ancestor of mine born in 1768.

For further information, see my my website or my GitHub or my LinkedIn account.