

**Updated**  
**September 17, 2025**

## Personal information

Name / Surname

**Thomas, Borsani**

## Current occupation

Institution

Location

Ph.D. topic

Supervisory team

Starting date

Expecting graduation date

Overview

## Ph.D. Student in Computer Science

Free University of Bozen-Bolzano

Bozen-Bolzano

Multi-task Learning in Deep Neural Networks

prof. Giuseppe Di Fatta, prof. Giuseppe Nicosia

November 2023

November 2026

My current research focuses on challenging the common assumptions surrounding Multi-Task deep learning models. Specifically, I am investigating their ability to transfer knowledge effectively across tasks.

## Work experience

Dates

Occupation or position held

Main activities and responsibilities

Name and address of employer

Type of business or sector

1.11.2020 - 30.09.2021

Temporary staff at Swiss Federal Research Institute WSL

Statistical modelling of lightning-caused fires. (Data getting and preparation with bash and R code. Data Modelling and Visualization in R code)

DR. Marco Conedera, marco.conedera@wsl.ch

Research

## Education and training

Dates

Title of qualification awarded

Grade

Occupational skills covered

Institution

September 2023

Master's degree in Computational Data Science

110/110 cum laude

Data Science, Machine Learning and Deep Learning

Free University of Bozen-Bolzano

Dates

Title of qualification awarded

Principal subjects

Institution

October 2020

Bachelor's Level Degree in Statistical and Economic Science

Statistical and Economic Science

Università degli Studi di Milano-Bicocca

## Research areas

Multi-Task Deep Learning, Optimisation, Machine Learning

## Personal skills and competences

Mother tongue

Other language(s)

*Self-assessment*  
*European level<sup>(\*)</sup>*

**English**

**Italian**

English

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
B2	B2	B2	B2	B2

<sup>(\*)</sup> Common European Framework of Reference (CEF) level

Social skills and competences	Cooperation, Active Listening, Debate, Teamwork
Technical skills and competencies	Data Science, Machine Learning, Deep Neural Networks, Multi-task deep learning
Computer skills and competencies	Python (pytorch, numpy, pandas), R, SQL
<b>Research activities</b>	<p><b>Stability of piecewise-linear systems</b></p> <p>In most Machine Learning (ML) approaches, the trained model is specialised on a single task and cannot be adopted to solve any other problem. In contrast, Multi-task Learning (MTL) is an ML approach in which a model is trained to solve multiple tasks simultaneously. This is similar to the learning process in humans, who learn general skills useful to multiple tasks: e.g., hand dexterity is useful to solve many tasks and is improved by learning many tasks at the same time. In recent years, MTL has been shown to be particularly effective in generating better-generalised models that take advantage of the similarities and differences across tasks. In my PhD project MTL methods will be investigated to identify and apply novel approaches for Deep Neural Networks. The overarching aim of this project is to contribute to the theory of transfer learning, , in MTL for explainable AI, and subsequently to apply this understanding to improve the monitoring of optimisation, , for effective use of MTL.</p>
<b>Publications</b>	<p><b>Refereed conference proceedings</b></p> <p>[1] M. Mock, T. Borsani, G. Di Fatta and B. Russo, "Optimizing Deep Learning Models to Address Class Imbalance in Code Comment Classification," 2025 IEEE/ACM International Workshop on Natural Language-Based Software Engineering (NLBSE), Ottawa, ON, Canada, 2025, pp. 45-48, doi: 10.1109/NLBSE66842.2025.00016.</p> <p>[2] Borsani, T., Rosani, A., Nicosia, G. and Di Fatta, G., 2025. Gradient Similarity Surgery in Multi-Task Deep Learning. arXiv preprint arXiv:2506.06130. (Accepted at ECMLPDKK 2025)</p>