

Curriculum Vitae

Prof. Tommaso Minerva

Professional Profile



I am a Full Professor of Statistics at the University of Modena and Reggio Emilia, with an academic background spanning physics, computational statistics, artificial intelligence, complex systems modelling, and digital education. My professional activity combines scientific research, teaching, and institutional responsibilities, with particular attention to the role of digital technologies in the organisation and development of higher education systems.

Over time, my work has evolved from computational modelling applied to physical and socio-economic systems to the design, coordination, and governance of digital education initiatives at institutional, national, and inter-university level. This trajectory reflects a sustained engagement with digital education, open learning, learning sciences, and data-informed approaches to innovation in higher education, in line with European research and policy frameworks.

Education and Early Scientific Training

I graduated in Physics from the University of Modena in 1987 and subsequently obtained a PhD in Condensed Matter Physics in 1992 from the University of Parma, within a consortial doctoral programme jointly hosted with the University of Modena.

Following the completion of my doctorate, I spent two years as a Visiting Scientist at IBM Research Laboratories in Almaden, San Jose (California). During this period, I worked on computational simulation approaches for the study of the electronic structure of superconducting oxides and transition metal oxides, further developing expertise in numerical modelling within internationally recognised research teams.

After completing my visiting scientist appointment, I continued my research activity as a research fellow supported by a grant from Convex Computer Corporation, one of the pioneering companies in the development of vector and parallel computing architectures. In this context, I strengthened my expertise in high-performance and parallel computing environments, applying advanced computational techniques to large-scale scientific simulations.

These experiences consolidated my methodological background in numerical modelling, parallel computation, and simulation-based scientific analysis, providing a solid foundation for my subsequent work in computational statistics, artificial intelligence, and complex systems.

Academic Career and Teaching Activity

Since 1998, I have held a permanent, full-time academic position at the University of Modena and Reggio Emilia, where I have progressively developed my career as Researcher (1998–2002), Associate Professor of Statistics (2002–2007), and Full Professor of Statistics since December 2007 (Scientific Sector: SECS-S/01).

My academic activity has been characterised by a strong interdisciplinary orientation, combining statistical and computational methods with applications in economics, communication, education, and digital technologies. I have taught across different faculties and departments, including Economics, Communication and Economics, the Department of Education and Human Sciences, and the Faculty of Medicine and Surgery, where I currently serve.

I have been responsible for a broad portfolio of undergraduate and graduate courses, including Computer Science, Computational Statistics, Data Analysis, Statistical Models for Decision Making, Information Management, and Computational Techniques for Data Mining. My teaching load has consistently exceeded standard academic requirements, often surpassing 40 ECTS per academic year, particularly during the formative phases of newly established degree programmes and during periods of major curriculum restructuring driven by national and European regulatory frameworks.

A distinctive feature of my teaching activity has been the systematic integration of digital, online, and blended learning methodologies. Starting in the early 2000s, I contributed to the design and delivery of fully online and blended degree programmes within a public university context, anticipating national and European developments in flexible and digitally mediated higher education.

My teaching commitment also includes extensive supervision activities. I have supervised or co-supervised Bachelor's theses and contributed to interdisciplinary thesis work at the Master's level, including applications of evolutionary algorithms and computational intelligence in economics, social systems, and clinical and medical contexts.

In 2019, I contributed to the design and establishment of the first Bachelor's Degree programme in Digital Education at the University of Modena and Reggio Emilia. This programme integrates learning sciences, digital technologies, data literacy, and educational innovation within a coherent curricular framework, addressing emerging societal and labour-market needs and aligning with European priorities on digital skills, lifelong learning, and the modernisation of education systems.

Research Activity and Scientific Focus

My research activity follows a coherent and progressive trajectory connecting computational physics, statistical modelling, artificial intelligence, and complex systems, later extending to digital education and learning ecosystems.

My early research focused on theoretical and computational condensed matter physics, particularly on the electronic structure of superconducting and transition metal oxides near critical phase transitions. This work provided a rigorous methodological foundation in computational simulation and numerical modelling.

From the late 1990s onwards, my research progressively shifted towards computational statistics and artificial intelligence, involving the development and application of evolutionary algorithms, neural networks, fuzzy logic systems, and wavelet-based methods for predictive modelling and time-series analysis. These approaches were applied to financial, economic, and socio-environmental systems, with attention to robustness, interpretability, and predictive performance.

A further line of research addressed the simulation of complex systems using cellular automata, contributing to the analysis of emergent phenomena and non-linear dynamics in socio-economic contexts.

In more recent years, my research interests have increasingly focused on digital education, e-learning systems, learning analytics, and institutional models for technology-enhanced learning. In this area, my work considers educational technologies as socio-technical systems, requiring integrated approaches that combine data analysis, pedagogical theory, organisational design, and governance.

I have participated in and coordinated nationally funded research projects (PRIN and FIRB), acting as local unit coordinator and contributing to interdisciplinary research consortia spanning statistics, education, computer science, and social sciences.

Institutional Leadership and Governance

A central component of my professional activity has been long-standing involvement in institutional leadership, academic governance, and the strategic development of higher education structures, with particular attention to processes of digital transformation.

In 2001, I was part of the founding group of researchers and academics who contributed to the establishment of the Faculty of Communication, Economics and Information at the Reggio Emilia campus of the University of Modena and Reggio Emilia. This initiative supported the academic and organisational development of the Reggio Emilia site, strengthening its educational offer and interdisciplinary profile.

From 2002, I began to design and develop distance and blended learning programmes for this Faculty, contributing to the creation of online and blended Bachelor's degree programmes in Communication and Marketing, Economics–Networks–Information, and Communication Sciences. These initiatives were developed in response to emerging needs for flexible learning pathways and preceded the broader institutional adoption of digital higher education models.

In 2005, I founded and became Director of the University e-Learning Centre (Centro e-Learning di Ateneo – CEA), with responsibility for the development of digital learning infrastructures, services, and methodologies at university level. The Centre supported the systematic integration of online and blended learning across degree programmes and contributed to the consolidation of institutional strategies for digital education.

I subsequently served as Rector's Delegate for e-Learning and later as Rector's Delegate for Teaching, where my responsibilities included coordinating university-wide educational planning, supporting curriculum innovation, and ensuring alignment with quality assurance frameworks. In 2014, the University e-Learning Centre evolved into EDUNOVA, a Centre Interateneo for Educational Innovation, and since then I have served as its Director, coordinating strategic initiatives involving multiple higher education institutions.

National Projects, Networks, and Coordination Roles

I have been involved in the design, coordination, and governance of large-scale national and inter-university initiatives in the areas of digital and open education.

Since 2015, I have served as Coordinator of the EduOpen project (<https://www.eduopen.org>), funded by the Italian Ministry of University and Research (MUR). EduOpen is a national initiative aimed at creating a federated portal for open education and MOOCs, supporting institutional collaboration among universities and addressing issues related to interoperability, quality assurance, and long-term sustainability.

From 2022, I have served as Administrative Coordinator of the National PhD Programme in Learning Sciences and Digital Technologies, initially established as a PhD of National Interest and subsequently implemented through formal agreements among a large number of Italian universities. In this role, I contribute to the coordination of academic and administrative processes within a distributed doctoral framework. In parallel, I coordinate the DREAM-Lab (Digital Research and Education: Analytics and Methodologies), focusing on data-driven approaches to digital education and learning analytics.

Since 2024, I have been Coordinator of the EDUNEXT network, a large inter-university and multi-institutional initiative focused on the systemic transformation of higher education through digital technologies, shared infrastructures, and innovation-oriented educational models.

EDUNEXT – National Digital Education Hub (PNRR Strategic Project)

Since 2024, I am the Coordinator of EDUNEXT – Italian Universities Digital Education Hub, one of the Digital Education Hubs of national interest funded under Italy's National Recovery and Resilience Plan (PNRR), Mission 4 "Education and Research", financed by the European Union – NextGenerationEU.

EDUNEXT is a large-scale strategic initiative designed to support the systemic transformation of Italian higher education through digital innovation, inclusive access, and advanced pedagogical models. The project brings together a federated network of 35 Italian universities and 5 AFAM institutions, supported by research bodies, regional authorities, and public and private stakeholders, representing one of the largest coordinated digital education initiatives in Europe.

The Hub aims to strengthen the quality, flexibility, and accessibility of higher education through:

- the development of digitally enhanced and blended degree programmes fully embedded in formal academic systems;
- a national ecosystem of MOOCs, open educational resources, professional training modules, and micro-credentials;
- shared digital platforms for learning delivery, interaction, certification, and knowledge management;
- competency-based models aligned with European frameworks for skills recognition and lifelong learning.

EDUNEXT is explicitly conceived as a structural, sustainable intervention, extending beyond the PNRR funding horizon and designed to interoperate with European digital education strategies, open education policies, and future EU programmes.

In this role, I contribute to strategic governance, network coordination, and long-term sustainability planning at national and European level. My responsibilities also include the scientific coordination of educational and innovation activities within the Hub (<https://www.edunext.eu>).

Evaluation, Quality Assurance, and Scientific Communities

I have developed substantial experience in evaluation, quality assurance, and higher education governance, operating at the intersection of academic practice, institutional management, and public policy.

I am a qualified expert evaluator for ANVUR, the Italian National Agency for the Evaluation of Universities and Research, and I contribute to initial and periodic accreditation processes for degree programmes and higher education institutions, with specific expertise in digital, online, and technology-enhanced education. My evaluation activity is aligned with the European Standards and Guidelines for Quality Assurance (ESG).

I have served as President of the Evaluation Board of the University of Foggia and as a member of evaluation boards of telematic universities, contributing to institutional performance assessment, strategic monitoring, and the development of internal quality assurance processes.

In parallel, I hold leadership roles within scientific communities active in the field of digital education. I currently serve as President of the Italian e-Learning Society (Sle-L) and as Editor-in-Chief of the Journal of e-Learning and Knowledge Society, a peer-reviewed international journal ranked Q2. I have also served as a board member of the Italian Society for Media Education Research (SIREM). Through these roles, I contribute to the dialogue between research, institutional practice, and educational policy, supporting the dissemination of evidence-based approaches to innovation in higher education.

Skills and Languages

I combine advanced technical expertise with organisational and leadership skills developed through long-term experience in academic, institutional, and inter-university contexts. My competencies include the coordination of multidisciplinary teams, the management of complex projects and budgets, and the governance of large educational and research ecosystems, particularly in the area of digital and technology-enhanced education.

My native language is Italian. I have excellent proficiency in written and reading English and good oral communication skills, acquired through sustained participation in international research, institutional activities, and collaborative projects.

Publications

An updated list of publications can be found at:

<https://unimore.unifind.cineca.it/get/person/014545>

Short Bio

I am a Full Professor of Statistics at the University of Modena and Reggio Emilia, with an academic background spanning computational physics, statistical modelling, artificial intelligence, complex systems, and digital education. I hold a PhD in Condensed Matter Physics and gained international research experience as a Visiting Scientist at IBM Research Laboratories (Almaden, California), where I worked on computational simulation and high-performance computing applied to the study of superconducting and transition metal oxides.

Since the late 1990s, my research and academic activity has focused on computational statistics and artificial intelligence, with applications to complex socio-economic systems, and has progressively extended to digital education, learning analytics, and technology-enhanced learning environments. My work combines quantitative methods with interdisciplinary approaches, addressing both methodological and applied research questions.

My academic activity includes long-term involvement in the development of online, blended, and digitally supported learning within public universities. In 2019, I contributed to the design and establishment of the Bachelor's Degree programme in Digital Education at the University of Modena and Reggio Emilia, developed in response to emerging educational and labour-market needs.

I currently serve as Director of the inter-university centre EDUNOVA and as Administrative Coordinator of the PhD programme in Learning Sciences and Digital Technologies. I also coordinate the DREAM-Lab (Digital Research and Education: Analytics and Methodologies), which focuses on data-driven approaches to digital education and learning analytics. In addition, I am President of the Italian e-Learning Society (Sle-L) and Editor-in-Chief of the Journal of e-Learning and Knowledge Society, a peer-reviewed Q2-ranked international journal. I further coordinate national initiatives in digital and open education, including EduOpen, the Italian open education and MOOC platform funded by the Ministry of University and Research, and EDUNEXT, a PNRR-funded Digital Education Hub of national interest. My experience also includes institutional governance and quality assurance activities, supporting the coordination of complex educational initiatives and alignment with national and European frameworks.