UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Activities and Publications Report

PhD Student: Arianna Anniciello

Student DR number: DR996637

PhD Cycle: XXXVIII
PhD Chairman: Prof. Stefano Russo

PhD program student's start date: 01/11/2022
PhD program student's end date: 31/10/2025

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Co-supervisor:

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PhD scholarship funding entity:
No Scolarship

General information

Dr. Arianna Anniciello received in year 2022 the Master Science degree in Management Engineering from the University of Napoli Federico II. Within the PhD program in Information Technology and Electrical Engineering, she attended a curriculum in Computer Engineering / Operational Research. She enrolled into the ITEE PhD program without a grant.

Study activities

Attended Courses

Year	Course Title	Type	Credits	Lecturer	Organization
1st	On the challenges and impact of Artificial Intelligence in the Insurance domain	Ad-hoc Course	3	Ing. Lorenzo Ricciardi Celsi	DIETI-Unina
1st	Using Deep Learning properly	Ad-hoc Course	4	Dr. Raffaele Della Corte, DIETI	DIETI-Unina
1st	IoT Data Analysis	Ad-hoc Course	4	Dr. Andrea Apicella, DIETI	DIETI-Unina
1st	Academic Entreprenuership	Ad-hoc Course	4	Prof. P. Rippa, DII	DII-Unina
1st	I pilastri della trasformazione digitale	Ad-hoc Course	3	prof. Nicola Mazzocca - DIETI, Unina	DIETI-Unina
2nd	Percorso per il rafforzamento delle competenze sulla progettazione europea	Ad-hoc Course	3.4	Dr. Tommaso FOGLIA, Dr. Federico PORCEDDA. Dr. Veronica ROCCO	Ministero dell'Università e della Ricerca, Ateneo Federico II
3rd	La Scienza moderna e il problema della disciplina giuridica dell'IA	Ad-hoc Course	6	prof. Lucio Franzese, DIETI - Unina	DIETI-Unina
3rd	Advanced Models and Algorithms for Managing, Querying and Analyzing Big Multidimensional Data	Ad-hoc Course	4	prof. Alfredo Cuzzocrea	DIETI-Unina
3rd	Practical Network Intrusion Detection with Machine Learning and Generative AI	Ad-hoc Course	4	Dr. Giampaolo Bovenzi	DIETI-Unina
3rd	English Language	B	4	Mrs. Dianne Pickens	CLA - Unina
3rd	ESG per il futuro	B	3.2	Sole 24h	Sole 24h
3rd	PMP Exam Prep Seminar	B	3.5	Joseph Philips	Instructing.com
3rd	PM Academy	B	3.5	Luiss Business School	Luiss Business School
		B			

Attended Seminars

Year	Seminar Title	Credits	Lecturer	Lecturer affiliation	Organization
1st	Game Theory for Information Engineering	0,4	Prof. Leonardo Badia	University of Padua - Italy	Prof. Marcello Caleffi, DIETI - Unina
1st	From Cyber Situational Awareness to Adaptive Cyber Defence: Leveling the Cyber Playing Field	0,4	Prof. Massimiliano Albanese	George Mason University	Prof. Giancarlo Sperlì, DIETI - Unina
1st	Industry 4.0 Fundamentals in Bosch Applications	3	Prof. Ing. Mariagrazia Dotoli, Ph.D.	Politecnico di Bari	National Doctoral program in Autonomous Systems
1st	Nanoneuro: the power of nanoscience to explore the frontiers of neuroscience	0,2	dr.Aitzol Garcia-Etxarri	Donostia International Physics Center, Spain	prof. C. Forestiere
1st	Cylindrical Micro- and Nanowires: From Curvature Effects on Magnetization to Sensing Application	0,2	Prof. Manuel Vázquez	CSIC (Madrid, Spain)	proff. M. D'Aquino, C. Visone, DIETI, Unina
1st	Ricerca e formazione nella società della transizione digitale	1	Many	Consorzio Interuniversitario Nazionale per l'Informatica	Consorzio Interuniversitario Nazionale per l'Informatica
3rd	Argumentation-Based Reasoning Frameworks for Public Interest Communication in Healthcare	0.4	Prof. Sergio Flesca	University of Calabria	prof. Carlo Sansone, prof. Elio Masciari DIETI - Unina
3rd	Estimations of Unimodular Signal Waveform and Uncertain Receive Signal Steering Vector for Robust Optimal Receive Beamforming Design	0.2	Prof. Yongwei Huang	Guangdong Polytechnic Normal University	prof. Massimo Rosamilia, DIETI - Unina
3rd	A Gentle and Incomplete Introduction to Bilevel Optimization	0.2	Prof. Martin Schmidt	Trier University	prof. Maruzio Boccia, prof. Claudio Sterle, prof. Adriano Masone, DIETI - Unina

3rd	Optimization in Transportation and Logistics	0.2	Prof.Maria Grazia Speranza	University of Brescia	prof. Maruzio Boccia, prof. Claudio Sterle, prof. Adriano Masone, DIETI - Unina
3rd	Local Explainability in Machine Learning: A collective framework	0.2	Prof. Dolores Romero Morales	Copenhagen Business School,	prof. Maruzio Boccia, prof. Claudio Sterle, prof. Adriano Masone, DIETI - Unina
3rd	Exact and ML-guided Matheuristic approaches for a Truck-and-Drone delivery problem	0.2	Prof. Maurizio Boccia	DIETI - Unina	prof. Maruzio Boccia, prof. Claudio Sterle, prof. Adriano Masone, DIETI - Unina
3rd	AMTA Italian Node Workshop on RCS Estimation and Measurements	0.8			

Research activities

Arianna Anniciello participated in the research activities of the PICUS Lab (Pattern Analysis and Intelligent Computation for mUltimedia Systems) at the University of Naples Federico II. She worked specifically on the theme of Artificial Intelligence for Decision Making and AI Risk Evaluation in industrial environments, combining theoretical modeling with applied research in digital transformation contexts. Her contribution concerns the development of hybrid decision-making models that combine human judgment and algorithmic reasoning—such as the integration of the Analytic Hierarchy Process with Majority Judgment. She also contributed to the definition of a Risk Assessment Framework for AI projects, aligned with the AI lifecycle, which provides a structured methodology to evaluate risks, governance, and compliance in enterprise AI adoption.
Building on her experience in manufacturing enterprise, she shifted her focus on risk-adjusted and benefit-based indicators to quantify the economic and strategic impact of AI projects in industrial settings. This contribution bridges scientific research and managerial practice, supporting data-driven decision-making for sustainable and trustworthy AI-driven transformation in manufacturing and business environments. Through both theoretical modeling and applied research within digital transformation projects in the aerospace sector, the candidate contributed to advancing methods for trustworthy, data-driven, and economically sustainable AI adoption.

Tutoring and supplementary teaching activities

Credits summary

PhD Year	Courses (credits)	Seminars (credits)	Research (credits)	Tutoring / Supplementary Teaching (credits)
1st	19.6	5.2	14.2	0
2nd	1.8	0	34	0
3rd	28	2	76	0
Total	49.4	7.4	124.2	0

Research periods in institutions abroad and/or in companies

PhD Year	Institution / Company	Hosting tutor	Period	Activities
1st	University of …, City, Country	Name Surname, role		Research on … Lab experiments on … Joint scientific paper preparation …
1st	Company name	Name Surname, role		On-field experiments on …
2nd				
3				

PhD Thesis

Despite the exponential growth of Artificial Intelligence (AI) adoption, most industrial initiatives still struggle to demonstrate sustained value. Proofs of concept often succeed technically yet fail to scale, trapped between inflated expectations and underestimated organizational realities. The root cause lies in how value is conceived and measured: traditional cost–benefit analyses treat AI as a static investment, ignoring the temporal mechanisms—adoption inertia, learning saturation, quality decay, and compliance barriers—that shape its lifecycle performance.

This thesis introduces the Dynamic Benefit for Artificial Intelligence (DBAI) framework, a time-dependent model for assessing the lifecycle performance of AI initiatives across operational, organizational, and economic dimensions. The framework decomposes AI benefits into four dynamic components — adoption, learning, operational quality, and trust and compliance — each parameterized by readiness-adjusted factors derived through a fuzzy Multicriteria–Majority Judgment aggregation of expert knowledge. On the cost side, DBAI distinguishes non-recurring investments (deployment and integration) from recurring expenditures (usage, obsolescence, overhead), capturing the transition from upfront effort to steady operational regimes.

Our contribution lies in the explicit introduction of time dependence into both benefit and cost functions, enabling AI evaluation to move beyond static financial indicators toward a dynamic representation of how value emerges, decays, and stabilizes over time. The interplay between these dynamics reproduces the empirical J-curve of AI value realization: an initial negative phase dominated by investment, followed by

recovery as adoption accelerates, learning consolidates, and governance maturity stabilizes performance. Beyond analytical precision, DBAI bridges academic rigor and enterprise practice, providing a transparent and explainable framework for portfolio-level decisions that support responsible and sustainable AI adoption.

Research products

Research results appear in *8* papers published in international journals

List of scientific publications

International conference papers

A. Anniciello, E. Masciari,
A Judgment Aggregation Method for Fuzzy Multi-Criteria Decision Making,
31st Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP 2023),
Naples, Italy, Mar. 1–3, 2023, pp. 283–290, IEEE, DOI: 10.1109/PDP59025.2023.00051.

A. Anniciello, S. Fioretto, E. Masciari, E. V. Napolitano,
Human-in-the-Loop Generative AI for Explainable Insurance Decision Support,
International Conference on Information Integration and Web Intelligence (iiWAS 2025),
Matsue, Japan, Dec. 8–10, 2025, (to appear), proceedings forthcoming.

A. Anniciello, S. Fioretto, E. Masciari, E. V. Napolitano,
Covid-19 Impact on Health Information Technology: The Rapid Rise of e-Health and Big Data-Driven Innovation of Healthcare Processes,
IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2022),
Las Vegas, NV, USA / Changsha, China, Dec. 6–8, 2022, pp. 2759–2764, IEEE.

E. d'Ajello, D. Formica, E. Masciari, G. Mattia, A. Anniciello, C. Moscariello, S. Quintarelli, D. Zaccarella,
Decision Making with Clustered Majority Judgment,
International Database Engineering & Applications Symposium (IDEAS 2022),
Budapest, Hungary, Aug. 22–24, 2022, pp. 156–160, ACM, DOI: 10.1145/3548785.3548798.

A. Anniciello, S. Fioretto, E. Masciari, E. V. Napolitano,
Digital Twins for Traffic Congestion in Smart Cities: A Novel Solution Using Data Mining Techniques,
International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (IC3K 2023) – KMIS,
Rome, Italy, Nov. 13–15, 2023, pp. 241–248, SCITEPRESS.

E. d'Ajello, D. Formica, E. Masciari, G. Mattia, A. Anniciello, C. Moscariello, S. Quintarelli, D. Zaccarella,
Cluster Algorithm for Social Choice,
ECML PKDD 2022 Workshops,
Grenoble, France, Sept. 19–23, 2022, Springer CCIS (workshop proceedings), pp. 227–237, DOI: 10.1007/978-3-031-23618-1_15.

E. V. Napolitano, S. Fioretto, E. Masciari, A. Anniciello,
How Pandemic Affected the Adoption of e-Health Systems,
International Database Engineering & Applications Symposium (IDEAS 2023),
Heraklion, Crete, Greece, May 5–7, 2023, pp. 94–98, ACM, DOI: 10.1145/3589462.3589496.

E. d'Ajello, D. Formica, E. Masciari, G. Mattia, A. Anniciello, C. Moscariello, S. Quintarelli, D. Zaccarella,
Clustered Majority Judgement,
11th International Conference on Data Science, Technology and Applications (DATA 2022),
Lisbon, Portugal, Jul. 11–13, 2022, pp. 512–519, SCITEPRESS, DOI: 10.5220/0011319400003269.

Patents and/or spin offs

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Awards and Prizes

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Date 26/10/2025

PhD student signature _____

Supervisor signature _____