Curriculum Vitae

Croce Danilo

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Birth Date: July 20^{th}, 1982

Birth Place: Marino (RM)

Current Position: Associate Professor (SSD INFO-01/A, ex INF/01)
Department of Enterprise Engineering, University of Rome "Tor Vergata"

Main Research Topics

- Large Language Models (LLMs) and Generative AI: instruction tuning, multi-task and continual learning, sustainable adaptation and evaluation;
- Machine Learning for Natural Language Processing: kernel methods, syntactic/semantic parsing, information extraction;
- Semantic Search and Evidence-based AI: retrieval-augmented generation (RAG), fact verification, adaptive information retrieval;
- Multimodality and Grounded AI: vision-language models for captioning, Visual Question Answering, and situated reasoning;
- Human-Robot Interaction: situated language understanding, adaptive and context-aware interfaces;
- Ethics and Transparency in AI: interpretability, fairness, and "ethics-by-design" methodologies.

Education: Master's Degree in Computer Engineering at the University of Rome, "Tor Vergata" obtained in 2008 (110/110 *cum laude*).

Qualified as Professional Engineer after passing the Italian State Examination

Ph.D. in Computer Science and Control Engineering, University of Rome, "Tor Vergata", Rome (June 2012), Italy. Ph.D. Thesis title: "*Structured Learning for Natural Language Semantic Processing*"

Bibliometric Indicators (H-index)
Google Scholar[1]: 26
Scopus[2]: 20

[1] https://scholar.google.it/citations?user=dXewdYAAAAAJ
[2] https://www.scopus.com/authid/detail.uri?authorId=27567467600

Contents

1 Professional experience

Tenure-track Assistant Professor (RTD-B) at the Department of Enterprise Engineering, University of Rome "Tor Vergata", scientific-disciplinary sector INF/01 from September 2022 to September 2025.

Assistant Professor (RTD-A) at the Department of Enterprise Engineering of the University of Rome, "Tor Vergata", Academic discipline ING/INF-05, from August 2015 to July 2020.

Postdoc at the Department of Enterprise Engineering of the University of Rome, "Tor Vergata". Research Topic: "*Statistical Methods of Lexical Semantics for Advanced Search Engines*", Academic discipline ING-INF/05, between 2013 and 2014.

Postdoc at the Department of Enterprise Engineering of the University of Rome, "Tor Vergata". Research Topic: "*Algorithms and Machine Learning methods for Advanced Information Retrieval*", Academic discipline ING-INF/05, in 2012.

Visiting Student at the Computational Linguistics and Computer Science Department, University of Colorado at Boulder, CO, USA (February - May 2011). Research Topic "*Automated Verb Class Classification and Clustering*". Supervisors: Alessandro Moschitti and Martha Palmer.

Member of the *Semantic Analytics Group* (SAG) at the University of Rome, "Tor Vergata" since 2008.

Member of the *ART* Group, *Artificial Intelligence at Tor Vergata*, at the University of Rome, "Tor Vergata" since 2008.

2 Research Activity

My research activity focuses on the study and application of advanced *Machine Learning* techniques, with particular emphasis on models based on **Large Language Models (LLMs)**, deep neural networks, and innovative kernel methods for complex problems in *Natural Language Processing* (NLP), Information Retrieval, and Computer Vision. My interests range from theoretical modeling to the practical realization of intelligent applications, with a strong emphasis on epistemological transparency and the integration of ethical principles into algorithmic decision-making. In particular, I have worked on the development of **geometric models of lexical semantics**, **kernel-based learning** techniques, and **deep learning** methods, as well as the study of complex linguistic phenomena typical of Big Data and social networks. I have contributed to the original development of advanced AI applications in areas such as *Question Answering*, *Semantic Search*, *Human-Robot Interaction*, *Fact Verification*, *Sentiment Analysis*, and **multimodality** (Image and Video Captioning, Visual Question Answering). Throughout my career, I have promoted both theoretical and applied approaches, participating in the development of large-scale linguistic systems and resources for Italian and other languages, and addressing current topics such as sustainability, portability, and ethics in machine learning models.

My research activity focuses on the development of transparent, adaptive, and linguistically grounded AI systems, spanning from theoretical models of language understanding to large-scale multimodal and socially responsible applications.

The main research topics can be divided into the following main areas.

Machine Learning, Large Language Models, and Advanced Methods for NLP and Computer Vision. The main lines of my research have focused on the study, development, and application of Machine Learning techniques for the automatic processing of natural language and computer vision, with an approach that combines both theoretical and practical aspects.

- Study of innovative kernel functions for the syntactic and semantic representation and processing of texts, using Support Vector Machines, structured kernels, and neural networks, to enable complex tasks such as automatic classification, semantic role labeling, and large-scale lexical knowledge acquisition.
- Combination of kernel methods and deep neural networks to integrate explicit linguistic information within neural learning paradigms, addressing phenomena typical of social networks and Big Data.
- Development of methods for epistemological transparency in neural networks and the integration of ethical principles into machine learning algorithms.
- Investigation of unsupervised learning paradigms (semi-supervised, boosting), scalability and portability of models, and online learning techniques for continuous and cognitively plausible model updates.
- Definition of models and algorithms for classical NLP tasks, such as semantic analysis, named entity recognition, question answering, and semantic search, often reformulated as classification or ranking problems.
- Development of methods based on Transformer models, including few-shot, zero-shot, multi-task, and continual learning paradigms, for both NLP and multimodal applications.
- Integration of linguistic and visual information in multimodal models for advanced tasks such as Image Captioning, Video Captioning, and Visual Question Answering, including for the Italian language.
- Creation of multimodal benchmarks and model suites (MM-IGLU, MM-IGLU-IT), as well as development of models tailored for different linguistic and application contexts.
- Development of LLM-based models for syntactic and semantic parsing (e.g., U-DepPLLaMA), and study of the sustainability, modularity, and scalability of neural models through techniques such as LoRA and PEFT.

Main Results: These activities have produced internationally recognized original contributions, including: the development of semantic tree kernels that integrate lexical and grammatical information [98, 99, 131, 132, 86, 124, 102, 91, 125, 109, 110]; the combination of kernel methods and neural networks [56, 55, 74]; approaches for increasing epistemological transparency and injecting ethical constraints in neural processes [57, 58, 50]; application of semantic kernels to the acquisition of linguistic knowledge such as frames in the Frame Semantics paradigm [144, 145, 125, 142, 136]; models for online learning and incremental learning [83, 85, 118, 117, 108, 101]; advances in the use of Transformer-based models for few-shot, zero-shot, multi-task, and continual learning [47, 39, 34, 56]; and the development of resources and systems for multimodality in Italian (Image Captioning, Video Captioning, VQA) [77, 60, 38]. Among the most recent and relevant results (2023-2025) are the development of the ExtremITA and U-DepPLLaMA models for advanced linguistic analysis, and the multimodal suite MM-IGLU and MM-IGLU-IT for grounded language understanding, as described in the following recent publications [9, 11, 14, 17, 16, 18, 22]. These lines of research have recently been extended through multimodal and situated reasoning frameworks, including the G-SRL model for robot command understanding [1], the Sanskrit Voyager system for unified linguistic resource integration [2], and dialogue-planning approaches for Human-Robot Interaction [7].

Semantic Search, Adaptive Information Extraction, Fact Verification, and Retrieval-Augmented Gen-

eration. Research activities in this area have focused on the design of advanced tools for semantic search, adaptive information extraction, and automatic fact verification, combining traditional techniques (vector lexicons, word space models, matrix factorization) with modern approaches based on Large Language Models.

- Study and development of vector lexicons and distributed semantic representations through *word space* paradigms, co-occurrence analysis on large corpora, and algebraic factorization techniques, enabling large-scale *enterprise search* and conceptual querying.
- Design of flexible semantic search platforms, capable of managing both highly specialized lexicons and querying via concepts, sentences, document fragments, or keywords, applicable to vertical domains (tourism, banking) and the open Web.
- Adaptation, specialization, and evaluation of LLMs for semantic search and information retrieval in specific domains, including instruction-tuned models and pipelines leveraging external evidence.
- Development of Retrieval-Augmented Generation (RAG) systems, which combine large generative models with retrieval modules to produce informed responses grounded in external sources, enabling applications such as question answering and automated report generation based on up-to-date knowledge.
- Implementation of complete pipelines for automated fact-checking, particularly based on Wikipedia (e.g., the FEVER-it system), integrating retrieval modules, NLI verification, and claim validation.
- Study and implementation of automatic topic discovery techniques, using both probabilistic models (LDA, traditional topic modeling) and neural/embedding-based approaches, for unsupervised topic discovery and classification of large text collections.

Main results: These activities have led both to the development of industrial platforms for semantic search in various application domains (tourism, banking) and to methodological and applied contributions recognized in the literature. The results are discussed in [9, 17, 59, 54, 86, 103, 126, 123, 114, 112]. Recent work extends this paradigm to biomedical domains, with retrieval-augmented pipelines for question answering such as UniTor@BioASQ [4], and to graph-based reasoning and navigation tasks [5].

Social Media Analytics, Sentiment Analysis, Epidemic Intelligence, and Tourism. Research activities in this area have focused on the study and application of advanced Machine Learning techniques and linguistic-semantic models for the automatic analysis of opinions and social phenomena in texts produced on social media and the web. The focus has been on modeling polarity (sentiment), extracting opinions, and detecting signals in various application domains, including public health (epidemic intelligence) and digital tourism. Multiple media (forums, reviews, tweets, tourism portals) have been analyzed, in both Italian and English, using models ranging from lexical and semantic kernels to deep neural networks.

- Development of linguistic models for automatic classification of polarity, detection of subjective opinions, and identification of emerging topics in multilingual and multi-domain contexts.
- Study and implementation of techniques for the automatic acquisition of opinion lexicons and lexical resources for sentiment analysis.
- Creation of annotated benchmark corpora for the systematic evaluation of sentiment analysis systems in Italian.
- Analysis of emerging social phenomena via social media, with a special focus on applying NLP methods to epidemic intelligence: early detection of trends, events, and epidemiological signals through the automatic monitoring of textual data from social sources.

– Design of systems and pipelines for the automatic analysis of tourists' opinions and experiences, integrating data from social networks, online reviews, and thematic portals to monitor the digital reputation of destinations, discover new travel trends, and identify the perceptions and needs of travelers—supporting public bodies, regions, and tourism operators.

Main Results: These activities have led to the publication of relevant works and the creation of reference resources for the research community, including [9], [13], [25], [81], [82], [84], [109], [110], [113], [114], [106], [101], [72], [40], [80], [78]. Recent studies have also explored LLM-based sustainability and social responsibility reporting [3, 8], and fine-grained sentiment modeling grounded in frame semantics [6].

Natural Language Learning and Human-Robot Interaction (HRI). Research in this area has focused on the definition and implementation of advanced language workflows and neural frameworks for semantic understanding in robotic platforms, aiming for robust Human-Robot Interaction (HRI) across different domains and operational scenarios. These activities, carried out in collaboration with the Cognitive Robotics Laboratories at Sapienza University, have involved both theoretical and applied investigations:

– Design of general and modular linguistic workflows for robotic platforms, independent of the underlying system and operational tasks, leveraging psycholinguistic theories such as *Frame Semantics* for semantic parsing and command interpretation.
– Development of neural models (e.g., GrUT) for advanced semantic understanding of natural language commands, generating structured representations that connect linguistic meaning to the robot's internal knowledge base.
– Realization of context-aware human-robot interfaces that integrate semantic interpretation with the perception of the surrounding environment, enabling robots to adapt their responses to dynamic and situated contexts.
– Investigation of dynamic and developmental aspects of language understanding, including the integration of incremental learning and semantic adaptation as the robot interacts with humans and its environment.
– Application of HRI methodologies to the medical field, such as the development of robotic physiotherapist platforms capable of integrating physical and cognitive interaction ([37, 27]).

Main Results: The main achievements of this line of research are documented in international conferences and journals on robotics and computational linguistics. These include best paper awards ([93, 73]), the successful participation in the SemEval 2013 international evaluation campaign (Task: Spatial Role Labeling, [111]), and the development of context-aware processing pipelines such as `LU4R`. Key results are discussed in [79, 51, 105, 89, 87, 90, 92, 94, 104, 116], as well as recent contributions describing the GrUT model and medical HRI applications ([27, 37]). Recent research expands this direction through multimodal grounding and dialogue planning for Human-Robot Interaction [7, 1].

Ethics and Transparency in Machine Learning. Research activities in this area focus on the development of techniques and methodologies to make machine learning models not only more powerful and adaptable, but also more transparent, interpretable, and guided by explicit ethical principles. The goal is to address key challenges related to the trustworthiness of artificial intelligence systems, both from an epistemological standpoint and in terms of social responsibility and sustainability.

– Study of algorithmic techniques to increase the epistemological transparency of neural models and facilitate the interpretability of decisions made by deep networks, including in complex scenarios such as NLP, computer vision, and multimodal systems.

- Development and experimentation of the EthicalNN framework, a PyTorch-based architecture that allows the integration of explicit ethical constraints ("truth-makers") into the learning process, fostering the design of models that learn to respect moral principles and requirements of fairness and equity.
- Proposal and implementation of "Ethics by Design" methodologies for intelligent adaptive systems, with the aim of making ethical design a structural—not merely post-hoc—element in AI systems, thereby promoting transparent, sustainable, and socially responsible solutions in both industrial and scientific contexts.
- Application and validation of the developed techniques on real datasets and scenarios characterized by high ethical sensitivity (e.g., evaluation of bias, fairness, and accountability in judicial, social, and healthcare datasets).

***Main results*:** The main theoretical and applied innovations in this area are summarized in works on the EthicalNN architecture ([50]), on approaches to neural network transparency ([57]), and on the "Ethics by Design" paradigm for intelligent adaptive systems ([31]). These efforts are closely connected to the development of socially responsible NLP applications, such as sustainability and impact-oriented language modeling [3].

Overall, these research activities contribute to the development of sustainable, interpretable, and human-centered AI systems, integrating linguistic, visual, and ethical dimensions across diverse domains.

2.1 Scientific Awards

- Outstanding Paper Award, Workshop on NLP for Positive Impact (NLP4PI @ ACL 2025) [8]
- Best System Award, EVALITA 2023 [20]
- Best Paper Award, International Conference on Deep Learning Theory and Applications (DeLTA 2023) [25]
- Best Paper Award, Workshop on Natural Language for Artificial Intelligence (NL4AI, 6a edizione), 2022 [30].
- Best paper award, EVALITA 2020 [48]
- Best paper award, International Conference of the Italian Association for Artificial Intelligence (AIxIA 2019) [55]
- Best paper award, Fifth Italian Conference on Computational Linguistics (CLiC-it 2018) [64]
- Distinguished Young Paper, Third Italian Conference on Computational Linguistics, Napoli 2016. [87]
- IBM Best paper award COLING Conference (Rank A Conference) Dublin, August 2014. [109]
- Distinguished Young Paper, First Italian Conference on Computational Linguistics, Pisa 2014. [110]
- Best System Paper, RoboCup Symposium, Joao Pessoa, Brazil, 2014. [93]
- Best paper award, CICLING Conference, Mexico City, Mexico, March 2009. [139]

2.2 Systems Evaluated in International Evaluation Campaigns

The machine learning methods involved in the study of *Computational Natural Language Learning* and *Opinion Mining* have also been used for the participation in International Evaluation Campaigns (e.g., *SemEval* organized by the American Association of Computational Linguistics) or National Evaluation Campaigns (e.g., *EvalIta*, organized by the Italian Association for Artificial Intelligence and the Italian Association of Computational Linguistics), often with excellent results:

- BioASQ 2025 Task 13b: Participation with the **UniTor** system for modular biomedical question answering. [4] (**1st place** in Factoid and Ideal Answer tasks)
- EVALITA 2023: Participation in *all 13 tasks* with the **ExtremITA** system, based on Large Language Models trained on multiple Italian linguistic tasks. [20]
- EVALITA 2020 Task: "Task on Stance Detection", [48] (**Best System**)
- EVALITA 2020 Task: "Task on Meme Recognition and Hate Classification (Multimodal Artefacts Recognition)", [45] (**Best System**)
- EVALITA 2018 Task: "Task on Irony Detection in Italian Tweets", [67] (**Best System** in the Sarcasm Detection subtask)
- EVALITA 2018 Task: "itaLIan Speech acT labEliNg", [63] (**Best system**)
- SemEval 2016 Task: "*Community based Question Answering*", [86] (**Best system**)
- EVALITA 2016 Task: "*Sentiment Polarity Classification in Twitter*" (**Best System** on the "Sentiment Detection sub-task"), [81]
- SemEval 2014 Task: "*Aspect Based Opinion Mining*", [107] (**Second Best System** on the Topic Recognition sub-task)
- EVALITA 2014 Task: "*Sentiment Polarity Classification in Twitter*" (**Best System** on the "Irony Detection sub-task"), [106]
- SemEval 2013 Task: "*Spatial Role Labeling*", [111] (**Best system**)
- SemEval 2013 Task: "*Sentiment Analysis in Twitter*", [113]
- StarSem 2013 Task: "*Semantic Text Similarity*", [115] (**Best System** on "Semi-structured Text Similarity" recognition sub-task)
- SemEval 2012 Task: "*Semantic Text Similarity*", [122]
- EVALITA 2011 Task: "*Frame Labeling over Italian Texts*", [133] (**Best system**)

2.3 Major Invited Speeches

- Invited Teacher for the course "Large Language Models", held during the "Bertinoro International Spring School 2024 (BISS 2024)", Bertinoro, 2024.
  `https://cs.unibo.it/projects/BISS/2024/courses/`
  `https://github.com/crux82/BISS-2024`
- Lecture at the summer school "Advances in Artificial Intelligence 2024", organized by the Lake Como School of Advanced Studies, Como, 2024. Talk title: "Large Language Models (LLM)".
  `https://sites.google.com/unimib.it/advancesinai-2024/program`
- Invited talk titled "The phenomenon of hallucinations in LLMs", held at the Laboratory of the History of Linguistic Ideas, Department of Philosophy, "Sapienza" University of Rome, as part of the series "The Babel of Golems - Conversations on human and AI languages", Villa Mirafiori, Rome, 13 November 2024.
  `https://web.uniroma1.it/storiaideelinguistiche/seminari`
- Invited tutorial titled "Large Language Models and How to Instruction Tune Them (in a Sustainable Way)", presented at the Ninth Italian Conference on Computational Linguistics (CLiC-it 2023), Pisa, 2023.
  `https://clic2023.ilc.cnr.it/tutorial/`
- Invited Tutorial entitled "Training Neural Architectures for NLP", organized as part of the "Lectures on Computational Linguistics 2021" sponsored by the Italian Association of Computational Linguistics, June 2021.
  `https://www.ai-lc.it/en/lectures-2021/`
  `https://github.com/crux82/AILC-lectures2021-lab`

– Invited Research communication titled “Deep Learning in Semantic Kernel Spaces” at the Fourth Italian Conference on Computational Linguistics, Roma 2017.
– Invited Tutorial: “LU4R: Adaptive Spoken Language Understanding Chain For Robots" at the European Robotics League - Service Robots, Lisbon
– Invited Talk for the “IBM Best paper award" at the COLING 2014 conference, presenting the work “A context-based model for Sentiment Analysis in Twitter" [109].
– Invited Talk for the Best System at SemEval 2013, organized by the “Special Interest Group on Semantics of the American Association on Computational Linguistics", for the Task “Spatial Role Labeling".
– Invited Talk for the Best System at StarSem 2013, organized by the “Special Interest Group on Semantics of the American Association on Computational Linguistics", for the Task: "Semantic Text Similarity".

3 Academic and Professional Activities

Head of the Laboratory of the "Semantic Analytics Group" (SAG) since 2008[3]. The SAG carries out research activities in the area of Machine Learning for Natural Language Processing and collaborates with Italian and foreign research institutions for the organization of conferences (e.g. SemEval, EMNLP, Clic-It, Italian Workshop on Information Retrieval, EVALITA), the coordination of funded research projects and the promotion of Natural Language Processing in Italy and abroad.

Member of the Steering Committee of the Italian Association of Computational Linguistics (AILC) from 2022 to 2025, the largest network of research, academic institutions, and industrial organizations related to Computational Linguistics and applications of language technologies. AILC gathers about 200 individual members and companies, and is responsible for congress initiatives (Clic-It), editorial (the Italian Journal of Computational Linguistics) and evaluation campaigns (EVALITA) that gather very important initiatives of all Italian research in the area of language (such as linguistics, computational linguistics, artificial intelligence, physics of voice, cognitive sciences, digital humanities).
`https://www.ai-lc.it/en/association/`

3.1 Organizer/Chair of Conferences and Workshops

– Member of the Organizing Committee - Demo Track Chair at the “Conference of the European Chapter of the Association for Computational Linguistics” (EACL 2026).
`https://2026.eacl.org/committees/organization/`
– Member of the Organizing Committee - Publication Chair at the “14th Joint Conference on Lexical and Computational Semantics” (*SEM / StarSem 2025).
`https://starsem2025.github.io/`
– Organizing Committee Member - Special Track Organizer for the “Calamita” track at the 10th Italian Conference on Computational Linguistics (CLiC-it 2024). The track is dedicated to the evaluation of Large Language Models (LLMs) for Italian and received over 20 submissions.
`https://clic2024.ilc.cnr.it/`
– Member of the Organizing Committee - Publication Chair at the “Tenth Italian Conference on Computational Linguistics” (CLiC-it 2024).
`https://clic2024.ilc.cnr.it/organization/`

[3] `http://sag.art.uniroma2.it`

– Member of the Organizing Committee - Publication Chair at the “18th Conference of the European Chapter of the Association for Computational Linguistics” (EACL 2024).
https://2024.eacl.org/committees/organization/
– Member of the Organizing Committee - Publication Chair at the “2024 Conference on Empirical Methods in Natural Language Processing” (EMNLP 2024).
https://2024.emnlp.org/organization/
– Member of the Organizing Committee - Workshop & Tutorial Chair at the “22nd International Conference of the Italian Association for Artificial Intelligence” (AIxIA 2023).
https://www.aixia2023.cnr.it/call/workshops
– Member of the Organizing Committee - Demo Track Chair of the “The 17th Conference of the European Chapter of the Association for Computational Linguistics” (EACL2023).
https://2023.eacl.org/committees/organization/
– Member of the Organizing Committee - Publication Chair of the “2022 Annual Conference of the North American Chapter of the Association for Computational Linguistics” (NAACL2022).
https://2022.naacl.org/committees/organization/
– Member of the Organizing Committee - Publication Chair of the “60th Annual Meeting of the Association for Computational Linguistics” (ACL2022).
https://www.2022.aclweb.org/organisers
– Chair of the Fifth Workshop on Natural Language for Artificial Intelligence (NL4AI) co-located with the AIxIA 2021 conference.
http://ceur-ws.org/Vol-3015
– Publication Chair and Program co-Chair (Area Vision, Robotics, Multimodal and Grounding with Raffaella Bernardi) in the “Eight Italian Conference on Computational Linguistics" (CLiC-it 2021).
http://ceur-ws.org/Vol-3033/xpreface.pdf
– Chair of EVALITA 2020, the Italian campaign for the systematic evaluation of automatic processing systems for written and spoken texts in the Italian language.
http://ceur-ws.org/Vol-2765
– Chair of the Fourth Workshop on Natural Language for Artificial Intelligence (NL4AI) co-located with the AIxIA 2020 conference.
http://ceur-ws.org/Vol-2735
– Program co-Chair (Area Explainability of Deep Learning models for NLP with Aurelie Herbelot) in the "Sixth Italian Conference on Computational Linguistics”.
http://ceur-ws.org/Vol-2481/preface.pdf
– Chair of the Second Workshop on Natural Language for Artificial Intelligence (NL4AI) co-located with the AIxIA 2018 conference.
http://ceur-ws.org/Vol-2244
– Program co-Chair (Area Machine Learning for Natural Language Processing) in the “Fifth Italian Conference on Computational Linguistics" (2018).
http://ceur-ws.org/Vol-2253/preface.pdf
– Task Organizer: ABSITA: “Aspect-based Sentiment Analysis at EVALITA", [62]. The task is part of EVALITA, a national campaign for the systematic evaluation of automatic Natural Language Processing systems in Italian (2018).
http://sag.art.uniroma2.it/absita/
– Chair of the First Workshop on Natural Language for Artificial Intelligence (NL4AI) co-located with the AIxIA 2017 conference. Editor of the Workshop Proceedings published by CEUR (2017).
http://ceur-ws.org/Vol-1983

– Head of the Local Organizing Committee of the “Fourth Italian Conference on Computational Linguistics" (2017).
http://sag.art.uniroma2.it/clic2017
– Program co-Chair (Area NLP for Web and Social Media, with Felice dell’Orletta) of the “Third Italian Conference on Computational Linguistics" (2016).
http://ceur-ws.org/Vol-1749/preface.pdf
– Task Organizer: SENTIPOLC: “Sentiment Polarity Classification in Twitter" [33]. The task is part of EVALITA, a national campaign for the systematic evaluation of automatic NLP systems in Italian (2016).
http://www.di.unito.it/~tutreeb/sentipolc-evalita16/
– Head of the Local Committee of the Italian Workshop on Information Retrieval, Roma, 2014.
http://iir2014.uniroma2.it/

3.2 Program committee member for Conferences and Workshops

Member of the Program Committee of the main International and National Conferences in the area of Artificial Intelligence, Natural Language Processing, Machine Learning and Information Retrieval, such as:

– Conference on Artificial Intelligence (since AAAI 2015)
– Annual Meeting of the Association for Computational Linguistics (since ACL 2013)
– International Joint Conference on Artificial Intelligence (since IJCAI 2013)
– European Conference on Artificial Intelligence (since ECAI 2015)
– The International Conference on Computational Linguistics (since COLING 2014)
– Conference on Empirical Methods for Natural Language Processing (since EMNLP 2012)
– Conference on Computational Natural Language Learning (since CONLL 2015)
– The European Conference on Computational Linguistics (since EACL 2014)
– North Chapter of the Association for Computational Linguistics (since NAACL 2012)
– International Joint Conference on Natural Language Processing (since IJCNLP 2013)
– Conference on Lexical and Computational Semantics (since *SEM 2015)
– IEEE International Conference on Robot and Human Interactive Communication (since RO-MAN 2019)
– European Semantic Web Conference (since ESWC 2015)
– International Conference on Natural Language & Information Systems (since NLDB 2022)
– SIGIR Workshop on Semantic Matching in Information Retrieval (since SMIR 2014)
– International Conference on Language Resources and Evaluation (since LREC 2014)
– Italian Conference on Computational Linguistics (since CLIC-it 2014)
– Italian Information Retrieval Workshop (since IIR 2014)

3.3 Editorial Boards and Journal Reviewer

Guest editor of the Journal “Sensors” (Impact Factor 3.576) in the Special Issue “Deep Learning for Healthcare: Review, Opportunities and Challenges” (2022).
https://www.mdpi.com/journal/sensors/special_issues/Deep_Learning_Healthcare_Sensors

Member of the Editorial Board of the journal *Transactions of the Association for Computational Linguistics (TACL)*, published by the Association for Computational Linguistics (ACL), since 2018.

Technical Head of the Editorial Office of the "Italian Journal of Computational Linguistics", Academia

Press.
http://www.aaccademia.it/elenco-libri?aaidriv=3

Peer-reviewer for journals in the area of Artificial Intelligence, Natural Language Processing, Machine Learning ed Information Retrieval:

- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Transactions on Affective Computing
- Transactions of the Association for Computational Linguistics
- Information Retrieval Journal
- PLOS ONE
- Computational Intelligence and Neuroscience
- Knowledge-Based Systems Journal
- Information Processing and Management
- Intelligent Service Robotics
- Language Resources and Evaluation
- Journal of Web Semantics
- Applied Ontology
- MDPI Algorithms and MDPI Information
- Engineering Science and Technology, an International Journal
- Computers and Electrical Engineering
- Pattern Recognition Letters
- Expert Systems with Applications
- Italian Journal of Computational Linguistics

3.4 Software and Resources

GroundedSRL4HRI: Framework for *Grounded Semantic Role Labeling* (G-SRL) in Human-Robot Interaction. Introduces multimodal models for grounded semantic understanding and a synthetic data generation pipeline for domestic environments, based on linguistic and environmental constraints. The system combines diffusion-based image generation, automatic annotation, and MiniCPM-V training for situated command interpretation in robotics [1].

- https://github.com/crux82/GroundedSRL4HRI

Sanskrit Voyager: Unified web platform for interactive reading and linguistic analysis of Sanskrit texts. Integrates dictionary lookup, real-time text analysis, corpus search, and interactive reading for over 900 Sanskrit texts. Presented at the EMNLP 2025 System Demonstrations track [2].

- https://www.sanskritvoyager.com/
- Demo video: https://www.youtube.com/watch?v=FCKlW4NKJEc

BioASQ2025-UNITOR: Modular Biomedical Question Answering pipeline developed for the BioASQ 13b Challenge (CLEF 2025). The system integrates retrieval-augmented generation, synthetic snippet generation, and multi-task answer modeling to improve factual reliability and evidence traceability in biomedical QA [4]. Ranked among the top systems for Factoid and Ideal Answer tasks at BioASQ 2025.

- https://github.com/crux82/BioASQ2025-UNITOR

BioASQ2025 Benchmark Dataset: Curated datasets for training LLMs in biomedical information retrieval, snippet extraction, and multi-type answer generation. Built from the BioASQ 13b collection, the benchmark supports fine-tuning and evaluation of domain-adapted LLMs for evidence-based QA [4].

– Included within https://github.com/crux82/BioASQ2025-UNITOR

WikiGame-LLM-Eval: Experimental pipeline for evaluating *Large Language Models* (LLMs) on Wikipedia graph navigation, accompanying the paper "Evaluating Large Language Models on Wikipedia Graph Navigation: Insights from the WikiGame" [5]. The project provides a reproducible benchmark assessing models' ability in *multi-hop reasoning*, structural planning, and adherence to the real hyperlink graph of Wikipedia.

– https://github.com/crux82/wikigame-llm-eval

MM-IGLU-Dialogues: Repository accompanying the ACL Findings 2025 paper "Training Multi-Modal LLMs through Dialogue Planning for HRI" [7]. It provides code, data, and models for multimodal dialogue planning in Minecraft-like environments, enabling grounded interaction between a human "Architect" and an LLM-based "Builder." The system demonstrates how structured dialogue planning improves task executability and interaction clarity.

– https://github.com/crux82/MM-IGLU-Dialogues

BacKGen: Background Knowledge Generator — toolkit for augmenting textual datasets with retrieved knowledge snippets. Designed for data enrichment in retrieval-augmented generation (RAG) pipelines [6].

– https://github.com/crux82/BacKGen

MM-IGLU: Development of a benchmark and model suite for multimodal grounded language understanding in 3D environments. Includes BART models and multimodal architectures based on CLIP and LLaMA2-Chat-13B via LLaVA. The system supports command execution and interactive clarification generation in virtual or robotic contexts [16].

– https://github.com/crux82/MM-IGLU

MM-IGLU-IT: Italian version of the MM-IGLU system, with annotated datasets and fine-tuned models for natural command following in 3D multimodal environments. It is the first large-scale benchmark for grounded instruction following in Italian [11].

– https://github.com/crux82/MM-IGLU-IT

ExtremITA: Instruction-tuned LLM for Italian based on LLaMA and adapted via LoRA. Ranked first in 9 out of 22 tasks at EVALITA 2023. Highly modular, it supports sustainable fine-tuning via PEFT libraries [21].

– https://github.com/crux82/ExtremITA

U-DepPLLaMA: Framework for universal dependency parsing using autoregressive LLMs (LLaMA2). It casts parsing as a sequential task, achieving SOTA results in 26 languages without relying on dedicated architectures [15].

– https://github.com/crux82/u-deppllama

GrUT: Neural model for language understanding in Human-Robot Interaction contexts. Generates structured semantic representations (Frame Semantics) linked to the robot's internal knowledge, improving execution of complex spoken commands [29, 30].

– https://github.com/crux82/grut

FEVER-it: Full fact-checking system for Italian, based on Wikipedia. Includes a pipeline for evidence retrieval and NLI models to validate or refute claims in natural language [17].

– https://github.com/crux82/FEVER-it

EthicalNN: PyTorch-based neural architecture for integrating ethical decision-making into machine learning models. Supports learning guided by explicit moral principles ("truth-makers"), applied to sensitive datasets on fairness and bias [31].

– https://github.com/crux82/nn-ebd

KeLP: Kernel-based Learning Platform. I am one of the founders of the Kernel-based Learning Platform (KeLP) project, whose aim is the development of an open-source machine learning framework [66]. In particular, the aim of KeLP is to support the research within Kernel-based methods. KeLP in fact decouples learning algorithms from kernel functions, so as to encourage the development of new algorithms and/or kernels by inheriting each other functionality. KeLP has been entirely developed in Java and is available under the Apache 2.0 License.

– http://www.kelp-ml.org

GAN-BERT. Definition and implementation of a neural model for few-shot learning capable of applying Adversarial Learning methods to Transformer-based architectures. This activity is a collaboration with Amazon Seattle (Alexa Retail group) [47].

– https://github.com/crux82/ganbert
– https://github.com/crux82/ganbert-pytorch
– https://github.com/crux82/mt-ganbert

dats: Data augmentation toolkit for NLP. Provides a collection of augmentation strategies for text classification and sequence labeling tasks.

– https://github.com/crux82/dats

ACLPUB2. Responsible for the ACLPUB2 project with Ryan Cotterell (ETH Zürich & University of Cambridge) to develop a tool for generating Proceedings of all events organized by the American Association of Computational Linguistics (ACL).

– https://github.com/rycolab/aclpub2
– https://github.com/acl-org/aclpubcheck

GQA-IT: A large-scale Italian language dataset for training Deep Learning methods for Visual Question Answering. GQA-it contains more than 1 million question/answer pairs in Italian on 80K images. This resource is the result of the collaboration with the University of Pisa. [38].

– https://github.com/crux82/gqa-it

mscoco-it: A large-scale dataset in Italian for training Deep Learning methods for Automatic Image Captioning. The dataset contains more than 600,000 image/caption pairs. [60].

– https://github.com/crux82/mscoco-it

msr-vtt-it: A large-scale dataset in Italian for training Deep Learning methods for automatic video caption generation (*Automatic Video Captioning*). The dataset contains more than 200,000 video/caption pairs. [60].

– https://github.com/crux82/msr-vtt-it

SQUAD-IT. A large-scale dataset in Italian for the training and the systematic evaluation of Deep Learning methods for document-based Question Answering. The dataset contains more than 60,000 question/text/answer triples. [59, 65].

– https://github.com/crux82/squad-it

ABSITA. A large-scale Italian dataset for the training and the systematic evaluation of classification methods for the recognition of Opinions in touristic reviews. It is composed of more than 10,000 reviews. This dataset was used in the ABSITA competition organized in the context of EVALITA 2018. [62].

– http://sag.art.uniroma2.it/absita/

SENTIPOLC. A dataset for training classification methods for Sentiment recognition in microblog texts composed of more than 10,000 manually annotated tweets in Italian. This dataset has been used in the SENTIPOLC competition organized in the framework of EVALITA 2016. [33, 78].

– http://www.di.unito.it/~tutreeb/sentipolc-evalita16/

LU4R. Technical and scientific head of the team devoted to the development of an "adaptive spoken Language Understanding chain For Robots tool" (LU4R): a chain of the automatic interpretation of spoken commands to robots. This system is the result of the collaboration between the SAG group of the University of Rome, "Tor Vergata", and the Laboratory Ro.Co.Co. (Robot Cognitivi Cooperanti) of La Sapienza, University of Rome. The system is free to download via the Web and can be installed on a vast plethora of robotic architectures. LU4R has recently been made available to groups belonging to Robocup.

– http://sag.art.uniroma2.it/lu4r.html

3.5 Research Networks

– International collaboration since 2020 with Amazon Seattle (Alexa Retail group) to develop semi-supervised methods for automatic text classification based on adversarial learning paradigms. The results of this collaboration have been published in [47].
– Collaboration since 2021 with the University of Pisa for the study of Visual Question Answering methods. This collaboration has led to the construction of the first dataset for the training and evaluation of neural methods for VQA in the Italian language. [38].
– Collaboration from 2021 with ABI Lab to study neural methods for the automatic semantic enrichment of financial regulatory documents and study of methods for automatic generation of discrete structures reflecting banks' regulatory processes [39].
– International collaboration with the Qatar Computing Research Institute (QCRI). I am one of the founders of the "Kernel-based Learning Platform" (KeLP) project whose aim is the development of a framework to support the implementation of machine learning systems focusing on Kernel-based learning. KeLP is the result of the international collaboration between the Semantic Analytics Group of the University of Rome "Tor Vergata" and the Qatar Computing Research Institute.
  www.kelp-ml.org
– Responsible for hosting the portal of the Italian Association of Computational Linguistics (AILC)
  http://www.ai-lc.it/
– Collaboration since 2013 with the Cognitive Robotics Laboratories of the Sapienza University, for the study of robotic interfaces based on natural language for Human Robot Interaction. Scientific collaboration with the University of Rome, La Sapienza. I am one of the creators of LU4R, "adaptive spoken Language Understanding chain For Robots tool": a processing chain for the automatic interpretation of robotic spoken commands. LU4R is the result of the national collaboration between the Semantic Analytics Group of the University of Rome "Tor Vergata", and the Laboratory Ro.Co.Co. (Robot Cognitivi Cooperanti) of La Sapienza, University of Rome.
  http://sag.art.uniroma2.it/lu4r.html
  https://github.com/crux82/huric
– Member of the iFrame group, which involves the University of Trento, the Institute of Computational Linguistics of the CNR, the University of Pisa and the University of Bologna, for the

development of a semantic resource based on the Frame Semantics theory for the Italian language.
– Collaboration with the Computational Linguistics and Computer Science Department (University of Colorado) and the University of Trento for the study of Kernel-based methods for the automatic recognition of verbal classes in texts (2011).

4 Teaching and Academic Supervision

4.1 Current Teaching Responsibilities

– **Machine Learning** — Master's Degree in Computer Science, University of Rome "Tor Vergata" (2025-present).
– **Information Retrieval** — Master's Degree in Computer Science, University of Rome "Tor Vergata" (2019-present).
– **Operating Systems and Computer Networks** — Bachelor's Degree in Computer Science, University of Rome "Tor Vergata" (2023-present).
– **Lecturer**, "Data Governance and Management", Second Level Master in *Data Science for Public Administration*, University of Rome "Tor Vergata" (2024-present).
`https://datasciencepa.uniroma2.it/docenti-master/`

4.1.1 Previous Teaching Activities

– **Elements of Data Analytics** — Master's Degree in Management Engineering (2019-2023).
– **Java Programming for Mobile Devices** — Bachelor's Degree in Computer Science and Internet Engineering (2018-2025).
– **Teaching Assistantships:**
  – *Deep Learning* — Master's Degree in Computer Engineering and Computer Science (2022-present).
  – *Web Mining & Retrieval* — Master's Degree in Computer Engineering and Computer Science (2009-present).
  – *Database and Knowledge Management* — Bachelor's Degree in Computer Science, Computer and Management Engineering, and Internet Engineering (2012-present).
– **Teaching Assistant**, Second Level Master in *Big Data in Business* (2016-2017):
Courses: *Text Mining and Document Analysis*, *Social Media Analysis and Recommendation Systems*.

4.2 Doctoral Programs

Faculty Member of the Ph.D. Program in Data Science, University of Rome "Tor Vergata".
`https://datasciencephd.uniroma2.it/collegio-docenti`

4.2.1 Doctoral Supervision and Co-Supervision

I have actively contributed to the supervision of several Ph.D. students in the fields of Natural Language Processing, Machine Learning, and Artificial Intelligence, both as main supervisor and co-tutor.

Completed Ph.D. Students:
– Simone Filice — Ph.D. in Computer Science, University of Rome "Tor Vergata" (2016)

- Giuseppe Castellucci — Ph.D. in Computer Science, University of Rome "Tor Vergata" (2016)
- Emanuele Bastianelli — Ph.D. in Computer Science, Sapienza University of Rome (2016)
- Andrea Vanzo — Ph.D. in Computer Science, Sapienza University of Rome (2018)
- Claudiu Daniel Hromei — Ph.D. in Artificial Intelligence (National Ph.D. Program in AI), University of Rome "Tor Vergata" (2025)

Ongoing Supervisions:

- Federico Borazio — Ph.D. in Data Science, University of Rome "Tor Vergata" (2^{nd} year)
- Shahid Iqbal Rai — Ph.D. in Data Science, University of Rome "Tor Vergata" (2^{nd} year)
- Seyed Alireza Mousavian Anaraki — Ph.D. in Data Science, University of Rome "Tor Vergata" (2^{nd} year)
- Natalia Pichierri — Ph.D. in Data Science, University of Rome "Tor Vergata" (2^{nd} year)
- Sergio José Peresson — Ph.D. in Data Science, University of Rome "Tor Vergata" (2^{nd} year)
- Giacomo De Luca — Ph.D. in Data Science, University of Rome "Tor Vergata" (1^{st} year)

4.3 Academic Events and Outreach

- **Local Organizer**, *Lectures on Computational Linguistics 2021* — annual school organized by the Italian Association for Computational Linguistics (AILC) on advanced topics in NLP for PhD students and young researchers.
  `https://www.ai-lc.it/en/lectures-2021/`

5 Research Projects

Co-founder and Academic Member of Reveal s.r.l., spin-off of the University of Rome "Tor Vergata" on language technologies and their applications in the Big Data scenarios. Reveal's customers include public institutions, banks (UniCredit, MPS), Italian and foreign industries (e.g., Aker Solutions, Norway). The solutions offered by Reveal are:

- RevNLT: the natural language toolkit for the linguistic processing and interpretation of unstructured data;
- Revealer: a suite for services for knowledge acquisition from texts, semantic indexing, natural language querying, automatic retrieval and semantic ranking;
- SentiRe: a distributed Service Oriented Architecture for Sentiment Analysis on the web, user-generated data streams and social networks.

Reveal is a member of Unindustria (Confindustria delle Imprese di Roma e del Lazio) since 2014, after being selected as a finalist, together with 14 other companies, for the 2014 Startup Award[4].

I have been involved in the following projects:

Academic Projects

- *Principal Investigator* of the project "Resources for Multimodal SEmanticS" (R4MSES), within the cascade call FAIR - Future Artificial Intelligence Research (PE00000013, SPOKE 5, CUP: B53C22003980006), funded by PNRR - NextGenerationEU (November 2024 - November 2025). The project is dedicated to the development of resources and frameworks for multimodal understanding and advanced human-machine interaction.

[4] `http://unirete.un-industria.it/2014/startup.php`

- *Principal Investigator* of the project "SHIELD – Secure Healthcare Information with Enhanced Learning and Data Integrity," a type B project funded at the Department of Enterprise Engineering (Tor Vergata) for a duration of 24 months (2024–2026). The project addresses the development and validation of advanced privacy-preserving machine learning techniques.
- *Technical lead* for the Tor Vergata unit in the project "Knowledge Integration for Nuclear Decommissioning", in collaboration with IAEA, aimed at document management and semantic indexing for transparency in nuclear decommissioning processes. (2024-2025)
- *Technical lead* for Tor Vergata in the project "CETERA" (*Progetto CETERA* MISE - CETERA - F/310151/05/X56 - CUP: B89J23001730005), focused on the development of LLM-based agents for education and digital learning. (2024-2026)
- *Scientific coordinator* for the Department of Enterprise Engineering, Tor Vergata, in collaboration with Aenduo s.r.l. (HomeRehab, PNRR), for the design of an AI-based virtual assistant supporting home rehabilitation for doctors and healthcare professionals. (2024-2025)
- *Participant* in the project "AI-driven Event Discovery: the ISS Epidemic Intelligence case" (2023-2024), in collaboration with the Istituto Superiore di Sanità. Development of LLM-based solutions for the detection and analysis of emerging epidemiological phenomena online, supporting public health initiatives.
- *Technical Manager* for the project "DECODE" (2022-2023) at the University of Rome Tor Vergata, in collaboration with ABILAB. The project focused on the application of Large Language Models for regulatory document analysis, supporting legal interpretation and compliance.
- *Technical and Scientific Manager* for the Department of Enterprise Engineering of the University of Rome, "Tor Vergata" in the "Deep2Net" project carried out at VEAS (a Norwegian company that manages the disposal of wastewater from Oslo and other Norwegian locations), for the application of neural methods for data-driven control of wastewater plants.
- *Scientific member* of the team participating to "*Semantic Search Engine: Enterprise Search and Process Management*" for the Department of Enterprise Engineering at the University of Rome "Tor Vergata", funded by UniCredit, Milan, December 2013-March 2015.
- *Technical Manager* of the Industrial project between the University of Rome "Tor Vergata" and Elettronica spa - Project: "ELT - Specific Emitter Verification" (2013).
- *Technical and Scientific Manager* for the FOXBIT unit, in the project DIVINO, coordinated by the Mastroberardino company, in the context of market intelligence activities in the food and wine domain, through the automation of Web Mining and Opinion Analysis processes as studied and developed in the context of Industria 2015. December 2009 - March 2014.
- *Scientific Manager* for the Roma Tor Vergata unit, in the project "*Progress-It*" (funded by the agency FILAS, FILAS-CR-2011-1089) from July 2012 to February 2014, for the engineering of an Enterprise Semantic Search solution dedicated to SMEs.
- *Scientific member* in the project European project *INSEARCH* (FP7-SME-2010-1, Research for the benefit of specific groups, GA n. 262491, December 2010-December 2012) for the study and development of an Enterprise Semantic Search system dedicated to Small and Medium Enterprises.
- *Technical Support* for the University of Rome *Tor Vergata*, in the project PRIN 2008, PARLI "Portale per l'Accesso alle Risorse Linguistiche per l'Italiano' (2009-2012).
- *Technical Manager* in the Industrial collaboration between the Department of Computer Science, Systems and Production of the University of Rome "Tor Vergata" and Elettronica spa - "design and implementation of algorithms for Automatic Recognition of sequence kernel-based radar emitters" (2008-2009).

Industrial Projects

- *Technical and Scientific Manager* for the unit of Reveal s.r.l. for the project "Opinion and Reputation Management", in collaboration with Target Reply for the definition, design and development of a system for Sentiment Analysis and Brand Reputation at ENEL (2022).
- *Technical and Scientific Manager* for the unit of Reveal s.r.l. for the project "ACI - Intelligent Image Processing License Plate Processing" for large-scale *quality assessment* of digitized documents at ACI (2021 - 2022).
- *Technical and Scientific Manager* for the unit of Reveal s.r.l. for the project "Healthcare Agents and Learning robots - HeAL9000", funded by the Lazio Region, under the "Progetti Strategici 2019 - Area di Specializzazione Scienze della Vita" (prot. A0320-2019-28108) for the design and development of a robotic physiotherapist (2020-2022).
- *Technical and Scientific Manager* for the unit of Reveal s.r.l. for the project "BAnking Semantic Search system" (BASS) for the design, development and deployment of a Semantic Search system for the internal regulatory documentation of the bank Monte dei Paschi di Siena (2021).
- *Technical and Scientific Manager* for the Reveal s.r.l. unit for the Project "*Re4CT - Revealer for Crime Tracking*", for the design, development and deployment of a Machine Learning and AI solution for the automatic analysis of texts, within the Italian Ministero degli Interno, Dipartimento della Pubblica Sicurezza (2020).
- *Technical and Scientific Manager* for the Reveal s.r.l. unit for the Project "*SIMOO - Surfing on the Map of Offers and Opportunities*": this project is in collaboration with the National Institute of Tourism Research (ISNART) for the definition, design and development of an intelligent system for the collection of tourism data on a national scale (2018).
- *Technical and Scientific Manager*, for the Reveal s.r.l., unit for the "*SARAI - Sentiment Analysis for RAI*" project, in collaboration with Target Reply from February to May 2018 for the definition, design and development of Sentiment Analysis system at RAI.
- *Technical and Scientific Manager*, for the Reveal s.r.l. unit, for the "*Internet for All (I4ALL)*" project, Horizon H2020 project - PON 2014/2020, in collaboration with Mediavoice srl and the University of Rome "La Sapienza" since January 2017 for the definition, design and development of an intelligent system to simplify the access to the Web by the visually impaired and the blind people.
- *Technical and Scientific Manager*, for the Reveal s.r.l. unit, for the "*Insideout*" project, in collaboration with the University of Bern and the University of Rome "La Sapienza" from January to December 2016 for the definition, design and development of an intelligent system for the analysis of adolescent behaviour on Social Networks.
- *Technical and Scientific Manager*, for the Reveal s.r.l. unit, for the "*Automated Systemic Support*" project, POR FESR Molise 2007-2013, since January 2015 for the definition, design and development of an intelligent system for the automation of Help Desk services.
- *Technical and Scientific Manager*, for the Reveal s.r.l., in the "*Aker Semantic Search*' project funded by Aker Solutions, Oslo Norway (2013-2015), for the definition and development of an Enterprise Semantic Search system dedicated to systems engineering for oil extraction in an underwater environment.

Publications

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[12] Andrea Brunello and Danilo Croce. Special issue: Selected papers from the aixia 2023 workshops. *Intelligenza Artificiale*, 18(1):5–8, 2024.

[13] Danilo Croce, Artem Smirnov, Luigi Tiburzi, Serena Travaglini, Roberta Costa, Armando Calabrese, Roberto Basili, Nathan Levialdi Ghiron, and Gerry Melino. Ai-driven transcriptomic encoders: From explainable models to accurate, sample-independent cancer diagnostics. *Expert Syst. Appl.*, 258:125126, 2024.

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