Curriculum Vitae et Studiorum

Marco Piangerelli, Ph.D.

PERSONAL INFO

Place and date of birth: Battipaglia (SA), Italy, January 30, 1984
City: Viale Lepanto 56, 62017- Portorecanati (MC), Italy
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Current Position: Research fellow (area 01/B1- Computer Science), scientific area: INF/01 (Computer Science), University of Camerino, School of Science and Technology, Computer Science Division

INTERNATIONAL MOBILITY

March 01, 2012 - August 8, 2012 (5 Months): Visiting Master Student
Cornell University - Veterinary Medicine School
Supervisors: Prof. Flavio Fenton, Prof. Robert Gilmour
During my stay, the foundation for training in the area of modeling and analysis of complex systems was laid. In particular, the work involved the formulation of mathematical, data-driven models for the prediction of cardiac arrhythmias under particular physiological conditions (hypocalcemia).

QUALIFICATIONS

Ph.D, July 2017
Computer Sciences,
Thesis: "A topological classifier for detecting the emergence of anomalous synchronization in brain activity",
Supervisor: Prof. Emanuela Merelli
University of Camerino, Italy

Master of Engineering, March 2013
Bioengineering,
Thesis: "The effects of hypocalcemia on spatial alternans and ventricular fibrillation studied with optical mapping technique",
Supervisor: Prof. Stefano Severi, Co-Supervisor: Prof. Flavio Fenton
Alma Mater Studiorum University of Bologna, Italy

Bachelor of Engineering, February 2009
Biomedical Engineering
Thesis: "Definizione di un protocollo per lo studio della deformazione delle labbra",
Supervisor: Prof. Maria Gabriella Signorini
Polytechnic of Milano, Italy

High School, July 2003
Maturità Scientifica, High School:Liceo Scientifico "G. Leopardi", Italy

Research Interests

- Data science and topological data analysis [**TOPDRIM, Da.Re., Chatbot, T.R.E.E., UNICAM 4 INGKA, Syeew, Lignani**][**R14, R13, R11, R10, R7, R5, C6, C5, C4, C3, PC2, PC1**]
- Complex systems: modeling and analysis [**R13, R11, C8,C7, C5, C4, C1, PC2, PC1**]
- Artificial intelligence using supervised learning, unsupervised learning and reinforcement learning [**T.R.E.E., Chatbot, SIMPLE, Syeew, MIRACLE, Lignani**][**R10, R7**]
- New methodologies and application of AI for industry, smart manufacturing, business and smart government, medicine and biology [**UNICAM 4 INGKA, Chatbot, MIRACLE**][**R14, R12, R11, R10, R4, R1, C8, C7, C6, C4, C2**]
- Modelling and analysis of self-adaptive systems [**SIMPLE**][**R7,C1, PC1,PC2**]

European Research Projects

"TOPDRIM - Topology Driven Method for Complex Systems"
Call: FP7-ICT-2011-8
Starting date and duration: 2012, 36 months
Budget: 2 457 563,00 Euro (Unicam 467 576,00 Euro)
Objectives: Many complex systems are characterized by multilevel properties. This makes the study of their dynamics and emergent phenomena a daunting task. The enormous amount of data available in the modern sciences will support great progress in these studies, although the nature of the data varies. It is therefore critical to extract as many features as possible from the data, including qualitative (topological) features. The goal of this project is to provide methods for describing the dynamics of complex multilevel systems. These methods will be guided by the topology of the data. To this end, the project will develop new mathematical and computational formalisms that take topological effects into account.
Partners: The project was proposed by Unicam as coordinator, jointly with ISI Foundation, The Open University, University of Amsterdam, Aix-Marseille University, and University of South Denmark, Denmark.
Role: Unicam research unit member

"Da.Re. - Data science pathways to re-imagine education"
Call: 2016-1-IT02-KA203-024645
Starting date and duration: 2016, 36 months
Budget: 417 873,00 Euro
Objectives: Over the past decade, the amount of available data has grown exponentially, introducing the concept of Big Data. Finding skilled professionals who can transform huge data sets into meaningful information, however, seems to be particularly difficult for businesses. Schools and universities need to adapt to these new demands by providing specially designed training and research plans. The Da.Re. Project aims to make a significant contribution to educational reform by bridging the gap between the needs of businesses and the educational offerings of higher education institutions in order to improve the functioning of the "knowledge triangle".
Partners: The project was proposed by Unicam, and the company Loccioni Group as lead partner, jointly with IPB, The Open University, UP, Confindustria Ancona, Maisis, eConsulting , Nissatech, Abelium and VSL.
Role: Unicam research unit member

Research Projects in collaboration with Companies funded by Marche Region

"MIRACLE - Marche Innovation and Research fAcilities for Connected and sustainable Living Environments - Laboratorio Marchigiano di ricerca e innovazione per ambienti di vita sostenibili e interconnessi"
Call: Programma Operativo Regionale del Fondo Europeo di Sviluppo Regionale POR MARCHE FESR 2014/2020 - ASSE 1 - OS 2 - AZIONE 2.1.1 - Sostegno allo sviluppo di Piattaforme tecnologiche di ricerca collaborativa, sviluppo ed innovazione negli ambiti della specializzazione intelligente
Subject Area: Home Automation
Starting date and duration: 2019, 36 months
Budget: 8.500.000,00 Euro (Unicam 815.265,00 Euro)
Objectives: MIRACLE has as its main objective the creation of a Laboratory of Excellence capable of evolving, experimenting and stimulating research and development activities of technologies, systems and approaches for the realization of innovative and interoperable solutions in the different commodity sectors traceable to the domain of home automation and living environments. The platform further aims to exploit research results through the implementation of three research and development projects that will fine-tune advanced technologies, listed above, which will then be developed and tested in the laboratory. In detail, Project 1 titled "IoT for Human Safety," Project 2, titled "Intelligent Systems for Environmental Comfort and Sustainability," and finally, Project 3 titled "Advanced Solutions for Human-System Monitoring and Interaction".
Parteners: The project was proposed by MAC Spa in partnership with Unicam, UnivPM, Meccano, INRCA, Guzzini, Elica, Ubsive, Videoworks, Rocchegiani, Proietti Tech, Leaff Engineering, Grottini Lab, Gitronica, Flowing, Ferretti, Eletica, Dago, BAX, Automa, ASK.
Role: Unicam research unit member (Unicam is one of the project partner).

Research Projects as a Company Consultant

"AI.EM - Artificial Intelligence Evolutive Machine
Client: Nuova Simonelli Group S.p.a. and Sigma S.p.a.
Subject Area: Artificial Intelligence / Smart Manufacturing
Starting date and duration: 2022, 36 months
Budget:1.956.000,00 Euro (UniCam 70.000,00 Euro)
Objectives: The aim of the project is to study and develop advanced artificial intelligence and machine learning algorithms, technologies and systems by means of which, on the one hand, production and service processes can be made more efficient and, on the other hand, new classes of machines with advanced AI can be developed with high environmental sustainability and unprecedented human-machine and machine-machine interaction and self-regulation functions to reduce energy consumption and waste. In particular: i) Introduction, in the machines, of unprecedented AI and adaptive ML functions for Energy Efficiency, capable of implementing dynamic power optimisation strategies such as to combine the reduction of energy consumption with the needs of instantaneousness and continuity of service; ii) Introduction of unprecedented AI algorithms and evolved machine-machine interaction systems aimed at reducing the waste of consumables, resources and raw materials associated with the normal operation of the machines and ordinary interventions to be carried out on them

"UNICAM 4 INGKA Inventory Process Mining"
Client: IKEA IT Aktiebolag
Subject Area: Artificial Intelligence / Process Mining
Starting date and duration: 2022, 24 months
Budget: 250 000,00 Euro)
Objectives:The overall goal of the initiative is to demonstrate the applicability of innovative process mining and machine learning techniques to solve business analytical problems in large-scale inventory management. The information below covers the proposed solution for the five sample problems identified in the preliminary

meetings, namely inventory corrections, transaction types in different CDCs, reliability of GiT ETAs, block characteristics, and transition from Goods in Transit to Goods on Delivery. The actual analytical business problems to be solved will be defined and described iteratively by the company. A total of at least 5 different business analytic problems must be solved. If sufficient progress is made against the time plan below, additional business problems will be considered. The solution will primarily leverage process mining and machine learning techniques and tools. Starting with a reasoned filtering of the raw input data, for each problem the University will perform a problem analysis, solution statement and validation through the implementation of a corresponding analytical software tool. Related to the overall objective above, the company will use these tools to gain insight into related business processes. related business processes and provide iterative feedback on value and applicability.
Role: Unicam research unit member (Responsible for the ML research).

"Syeew - Intelligent recommendation system for micro enterprises"
Client: Eidos S.r.l. Area tematica - Intelligenza Artificiale.
Starting date and duration: 2022, 24 months
Budget: 25 000,00 Euro)
Objectives: The project aims at jointly developing an IT study and research activity for the development of an intelligent recommendation system aimed at fostering the professional growth of young people in the area. The following areas of collaboration are of particular interest:

- IDP (INTELLIGENT DATA PROCESSING)
- RECOMMENDATION SYSTEM (Content based e Collaborative filtering)
- BUSINESS PROCESS e PROCESS MINING

Role: Member of the project board and member of the Unicam working unit.

"Chatbot - Research and prototyping on Artificial Intelligence topics for chatbot systems"
Client: Filippetti S.p.a.
Subject Area: Artificial Intelligence
Starting date and duration: 2022, 3 Months
Budget: 8 000,00 Euro
Objectives: The project aims to identify and study Artificial Intelligence techniques applied to NLP related to ChatBots and automatic response systems by supervising and directing the choices from a methodological and technological point of view; In addition, it is planned to carry out a benchmarking of the most appropriate tools to define a common framework of application of the identified techniques by integrating different algorithms.
Role: Member of the Unicam working unit.

"SIMPLE - Smart Manufacturing Machine with Predictive Lifetime Electronic maintenance"
Client: SIGMA S.p.A. and Schnell S.p.A.
Starting date and duration: 2019, 36 months
Budget: 288.487,50 Euro (Unicam)
Objectives: SIMPLE aims at studying and developing innovative products capable of implementing predictive maintenance logic, connected to an innovative platform that will be:

- Highly flexible, applicable, that is, with minimal configuration interventions, to the different types of products under study;
- of low cost, such that it does not significantly affect the total cost of the apparatus on which it will be integrated;
- non-invasive, designed in such a way so as not to disrupt or complicate the functionality and use of the product.

Partners: The project was presented by lead partner SIGMA S.p.A. and co-proponents Clabo S.p.A., Simonelli Group S.p.A., Schnell S.p.A. and Pieralisi Maip S.p.A.

Role: Member of Unicam's Research Unit for the unsupervised learning module as a consultant to Sigma and Schnell.

"T.R.E.E. - Tailored Rehabilatation for the Engagement Empowerment of cronically disabled people"
Call: POR FESR MARCHE 2014-2020 – Asse 1 – OS 3 – Azione 3.1 – Bando "Promuovere soluzioni innovative per affrontare le sfide delle comunità locali nell'ambito della salute e benessere attraverso progetti collaborativi di ricerca e sperimentazione tra imprese e strutture pubbliche/private che erogano servizi ai cittadini".
Starting date and duration: 20/02/2017, 36 months
Budget: 1.435.764,47 Euro
Objectives: The TREE project involves the creation of an integrated, modular and expandable platform for the implementation and monitoring of personalized rehabilitation processes of subjects with chronic disabilities. The target pathologies of the project are those of subjects with chronic disabling outcomes from brain or spinal cord injury, subjects with movement disorders, and subjects with mild cognitive impairment (mild cognitive impairment). The platform will give the opportunity to administer rehabilitation treatments on two types of environments: specialized facilities dedicated to rehabilitation, for severe chronic conditions, and the home environment, which in addition to the patient's home also includes RSAs..
Partners: Roxor ,Picchio ,Meta, JesiLab Isidori Ventilazione, Il Picchio consorzio cooperative sociali - Soc. Coop, Hp Composites, G ENERA S.C.A R.L., Az.Osp.Univ. Ospedali Riuniti Ancona 4D Engineering S.R.L., Unipersonale
Role: Member of Unicam's Research Unit for the Behavioral Analysis module as a consultant to HP Composites..

Research Projects funded by University of Camerino

"Nutrigenomic role of bioactive compound extracted from legumes: New Insights on Lignans"
Call:Doctoral Candidates Research Grants (DCR grants) 2016
Starting date and duration: 2017, 24 months
Budget: 16 666,66 Euro
Objectives: The present project, considering the well-established health properties of lignans and their possible new interesting role as epigenetic modulating molecules, aims to study the protective effect on low-grade inflammation of the natural mixture of lignans isolated from legumes and the possible role of epigenetic intermediation on this process. The identification of the optimal mixture will be done using a mix of extraction techniques with data analysis and clustering techniques to identify emergent patterns in the laboratory data
Partners: Unicam Chemistry Division, Unicam Computer Science Division and Unicam Biochemistry Division.
Role: Coordinator of the Computer Science Division's Research Unit.

"MATREND -MAterials and Technologies for improving the use of Renewable ENergy in the Districts of smart city"
Call: University funds for research (FAR) 2014-2015
Starting date and duration: 2014, 36 months
Budget: 60 000,00 Euro
Objectives: In addition to dealing with research in areas such as the study of subsurface characteristics and deep heat transfer, the MATREND project wants to test the use of geothermal plants in combination with other plants as a strategy for energy upgrading of public and private buildings, combining new technologies that are relatively mature but need a better development phase for wider market distribution, and to study innovative energy storage systems. Not least is the goal of drastically reducing greenhouse gas emissions.
Partners: Unicam Geology Section, Unicam Computer Science Division, Unicam Physics Division, Pensy s.r.l., Geotermia Marche s.n.c., Otto s.r.l., Fullservice Soc.Coop.

Role: Member of Unicam Computer Science Division's Research Unit.

SUPPORTING ACTIVITY

Journal (Guest) Editor

- Special Issue "Information Theory for Interpretable Machine Learning", Entropy, MDPI
- Special Issue "Topological Data Analysis Meets Information Theory. New Perspectives for the Analysis of Higher-Order Interactions in Complex Systems", Entropy, MDPI

Program (Co-)Chair

- 9th Int. Symposium on Engineering Energy Efficient InternetWorked Smart seNsors (E3WSN), Collocated with the 37th International Conference on Advanced Information Networking and Applications (AINA-2023) 2023

Programme Committee - International Workshops

- AAAI-MAKE 2024 Spring Symposium on Empowering Machine Learning and Large Language Models with Domain and Commonsense Knowledge. Stanford University, Stanford, California. March 25-27, 2024.
- SACAIR 2023, Southern African Conference for Artificial Intelligence Research, 4 - 8 December 2023
- 18th International Conference on Design Science Research in Information Systems and Technology (DESRIST 2023). Future Africa, University of Pretoria, South Africa, 31 May - 2 June, 2023
- AAAI-MAKE 2023 Spring Symposium on Challenges Requiring the Combination of Machine Learning and Knowledge Engineering. San Francisco, California, USA, 27-29 March, 2023.
- AAAI-MAKE 2022 Spring Symposium on Machine Learning and Knowledge Engineering for Hybrid Intelligence. Stanford University, Palo Alto, California, USA, 21-23 March, 2022.
- ATDA2019: Workshop on Applications of Topological Data Analysis 2019. Würzburg, Germany, September 16, 2019.

Programme Committee - National Workshops

- WOA: 19th Workshop From Objects to Agents. Palermo, Italy, June 28-29, 2018

Referee

- Internet of Things, Elsevier
- Journal of Intelligent Manufacturing, Springer
- Entropy, MDPI

- 2nd Conference on Society 5.0 - Integrating Digital World and Real World to Resolve Challenges in Business and Society
- ICEDEG 2020 - Sixth International Conference on eDemocracy & eGovernment
- FSEN 2019 -8th IPM International Conference on Fundamentals of Software Engineering
- WOA 2016 - XVII WORKSHOP 'From agents to objects"
- FoCAS@SASO15 - 3rd FoCAS Workshop on Fundamentals of Collective Adaptive Systems
- Scientific Reports, Springer Nature
- Neurocomputing, Elsevier
- Computers in Biology and Medicine, Elsevier
- IEEE Transactions on Knowledge and Data Engineering, IEEE
- IEEE Transactions Industrial Informatics, IEEE
- BMC Public Health
- Chaos, Solitons and Fractals, Elsevier
- EPJ Data Science, Springer
- IEEE Transactions on Information Theory, IEEE
- Iranian Journal of Science and Technology, Springer
- Epilepsy Research, Elsevier

PUBLICATIONS

Journals (peer-reviewed)

R14 Ciccarelli,M., Corradini, F., Germani, M., Menchi, G., Mostarda, L., Papetti, A.,Piangerelli, M.. SPECTRE: a deep learning network for posture recognition in manufacturing. *Journal of Intelligent Manufacturing, 2022*

R13 De Simone, A. and Piangerelli, M. A Bayesian approach for monitoring epidemics in presence of undetected cases. *Chaos, Solitons and Fractals 2020, 140, 110167*

R12 Bordoni, L.; Fedeli, D.; Piangerelli, M.; Pelikant-Malecka, I.; Radulska, A.; Samulak, J.J.; Sawicka, A.K.; Lewicki, L.; Kalinowski, L.; Olek, R.A.; Gabbianelli, R. Gender-Related Differences in Trimethylamine and Oxidative Blood Biomarkers in Cardiovascular Disease Patients. *Biomedicines 2020, 8, 238.*

R11 Piangerelli, M.; Maestri, S.; and Merelli, E. Visualising 2-simplex formation in metabolic reactions. *Journal of Molecular Graphics and Modelling 2020, 97.*

R10 Vito, L.; , Marcelli, E.; Piangerelli, M.; De Leone, R.; Pucciarelli , S.; Merelli, E. Machine learning models predicting multidrug resistant urinary tract infections using "DsaaS". *BMC Bioinformatics 2020, 21, 347*

R9 Nasuti, C.; Fedeli, D.; Bordoni, L.; Piangerelli, M.; Servili, M.; Selvaggini, R.; Gabbianelli, R. Anti-Inflammatory, Anti-Arthritic and Anti-Nociceptive Activities of Nigella sativa Oil in a Rat Model of Arthritis. *Antioxidants 2019, 8, 342.*

R8 Bordoni, L.; Fedeli, D.; Piangerelli, M.; Gabbianelli, R., HTR2C gene variant and salivary cortisol levels after endurance physical activity: a pilot study, B*Lifestyle Genomics, 2019*

R7 Piangerelli, M.; Rucco, M.; Tesei, L.; Merelli, E. Topological classifier for detecting the emergence of epileptic seizures. *BMC research notes, 2018*

R6 Romanelli, P.; Piangerelli, M.; Ratel, D.; Gaude, C.; Costecalde, T.; Puttilli, C.; Picciafuoco, M.; Benabid, A.; and Torres, N. A novel neural prosthesis providing long-term electrocorticography recording and cortical stimulation for epilepsy and brain-computer interface. *JNS, 2018*

R5 Bordoni, L., Marchegiani, F.; Piangerelli, M.; Napolioni, V.; Gabbianelli, R. Obesity-related genetic polymorphisms and adiposity indices in a young Italian population. *IUBMB Life, 2017*

R4 Ferraro, S.; Nasuti, C.; Piangerelli, M.; Giovannetti, R.; G., Guidi, M.; Ferri, A.; and Gabbianelli, R. Hair Microelement Profile as a Prognostic Tool in Parkinson's Disease. *Toxics, 2016.*

R3 Domingues, V.F.; Nasuti, C.; Piangerelli, M.; Correia-Sá, L.; Ghezzo, A.; Marini, M.; Abruzzo, P.M.; Visconti, P.; Giustozzi, M.; Rossi, G.; Gabbianelli, R. Pyrethroid Pesticide Metabolite in Urine and Microelements in Hair of Children Affected by Autism Spectrum Disorders: A Preliminary Investigation. *Int. J. Environ. Res. Public Health 2016, 13, 388.*

R2 Nasuti, C.; Ferraro, S.; Giovannetti, R.; Piangerelli, M.; Gabbianelli, R. Metal and Microelement Biomarkers of Neurodegeneration in Early Life Permethrin-Treated Rats. *Toxics 2016*

R1 Piangerelli, M.; Ciavarro, M.; Paris, A.; and Marchetti, S.; Cristiani, P.; and Puttilli, C.; and Torres, N.; and Benabid, A.L.; and Romanelli, P. A fully integrated wireless system for intracranial direct cortical stimulation, real-time electrocorticography data transmission, and smart cage for wireless battery recharge. *Frontiers in neurology, 2014*

Pubblicazioni su Conferenza o Workshop Internazionali (peer-reviewed)

C10 Corradini, F., Luciani, C., Morichetta, A., Piangerelli, M.. Managing Variability of Large Public Administration Event Log Collections: Dealing with Concept Drift. BIR 2023.

C9 Cacciagrano, D., Corradini, F., Piangerelli, M., Sensorless predictive maintenance: an example on a 'not 4.0' coffee machine production process. International Conference on Advanced Information Networking and Applications (AINA). Cham: Springer International Publishing, 2023.

C8 Corradini, F., Luciani, C., Morichetta, A., Piangerelli, M., Polini, A. Label-independent feature engineering-based clustering in Public Administration Event Logs. Accepted In: Electronic Government. EGOV 2022.

C7 Corradini, F. Luciani, C., Morichetta, A., Piangerelli, M., Polini, A. TLV-diss$_\gamma$: A Dissimilarity Measure for Public Administration Process Logs. In: Scholl H.J., Gil-Garcia J.R., Janssen M., Kalampokis E., Lindgren I., Rodríguez Bolívar M.P. (eds) Electronic Government. EGOV 2021. Lecture Notes in Computer Science, vol 12850. Springer, Cham.

C6 Shiferaw G., Mamuye A., Piangerelli M. (2019) Stationary Wavelet Transform for Automatic Epileptic Seizure Detection. In: Mekuria F., Nigussie E., Tegegne T. (eds) Information and Communication Technology for Development for Africa. ICT4DA 2019. *Communications in Computer and Information Science, vol 1026. Springer*

C5 Piangerelli M., Tesei L., Merelli E. A Persistent Entropy Automaton for the Dow Jones Stock Market.In: Hojjat H., Massink M. (eds) Fundamentals of Software Engineering. FSEN 2019. Lecture Notes in Computer Science, vol 11761. *Springer*

C4 Merelli, E., Piangerelli, M., Rucco, M., Toller, D. A topological approach for multivariate time series characterization: the epileptic brain. *EAI Endorsed Transaction on Self-Adaptive Systems, 2016*

C3 Merelli E., Rucco, M,; Tesei, L., Piangerelli, M., Mamuye, A., and Quadrini, M. Survey of TopDrim applications of Topological Data Analysis. *Proceedings of the 2nd International Workshop on Knowledge Discovery on the WEB, KDWeb, 2016*

C2 Piangerelli, M., Paris, A., Romanelli P. Cyberbrain: a preliminary experience on non-human primate. *Neurotechnix 2014 Proceedings* .

C1 Merelli, E.; Piangerelli, M. RNN-based model for self-adaptive system- The emergence of epilepsy in the human brain. *IJCCI 2014 Proceedings.*

Other publications

V4 Corradini, F., Loreti, M., Piangerelli, M., Rocchetti, G. REPTILE: A Proactive Real-Time Deep Reinforcement Learning Self-adaptive Framework arxiv 2022

V3 Piangerelli, M.; Rocchetti, G; Liscio, A; and A. De Leone, R. BinarySDG: binary sensor data generation with R arxiv 2019

V2 Handbook of Machine Learning (book). Da.Re. Consortium. Free download at http://dare-project.eu/download/

V1 Johnson, J.; Tesei, L.; Piangerelli, M.; Merelli, E.; Paci, R.; Stojanovic, N.; ... and Amador, M. Big data: business, technology, education, and science. *ACM Ubiquity, 2018(July), 2.*

CONFERENCE SPEAKER

Scientific

CS4 8th IPM International Conference on Fundamentals of Software Engineering, FSEN, 2019, Teheran, Iran

CS3 2nd International Workshop on knowledge discovery on the WEB, KDWeb, 2016, Cagliari, Italy

CS2 6th International Joint Conference on Computational Intelligence, IJCCI, 2014, Rome, Italy

CS1 2nd International Congress on Neurotechnology, Electronics and Informatics, Neurotechnix, 2014, Rome, Italy

Educational

CD5 Nuove ed emergenti prospettive per la società digitale - 4th Edition - Invited Speaker, 2023

CD1 Nuove ed emergenti prospettive per la società digitale - 3rd Edition - Invited Speaker, 2022

CD1 Nuove ed emergenti prospettive per la società digitale - 2nd Edition - Invited Speaker, 2021

CD1 Nuove ed emergenti prospettive per la società digitale - 1st Edition - Invited Speaker, 2020

CD1 Virtual Workshop on TOPOLOGICAL INTERACTIVE COMPUTATION A NEW PARADIGM IN THE ERA OF BIG DATA - Invited Speaker, 2019

Invited Speaker

PC2 TDA and Persistent Homology: a new method for analysing temporal graphsWorkshop on Algorithmic Aspects of Temporal Graphs II - ICALP 2019

PC1 Topological Data Analysis: from data to knowledge, IMT, Lucca (Italy), Maggio 2019

MEDIA

M2 Un R_t preciso? Il modello è targato SISSA. *Il Piccolo. 1 Dicembre 2020*

M1 Perchè l'Italia è in vantaggio su Spagna e Francia. E come capire i contagi in autunno. *Il sole 24 Ore, Versione on line. 22 Settembre 2020*

TEACHING ACTIVITY FOR PHD

Over the years, I have received the following teaching assignments for the PhD course in "Computer Science and Mathematics," delivered in English. I am currently co-supervisor of three Ph.D. students.

Teachings for Ph.D.

Academic Year 2023-2024

- Machine Learning and its application (2 ETCS) - INF/01, Ph.D in Computer Science and Mathematics, University of Camerino

Academic Year 2022-2023

- Machine Learning and its application (2 ETCS) - INF/01, Ph.D in Computer Science and Mathematics, University of Camerino

Academic Year 2021-2022

- Machine Learning and its application (2 ETCS) - INF/01, Ph.D in Computer Science and Mathematics, University of Camerino

Academic Year 2020-2021

- Machine Learning and its application (2 ETCS) - INF/01, Ph.D in Computer Science and Mathematics, University of Camerino

Academic Year 2019-2020

- Machine Learning and its application (2 ETCS) - INF/01, Ph.D in Computer Science and Mathematics, University of Camerino

Supervision

PhD

- 2023 – 2027 Martina Zannotti (Co-Supervisor)
  Topic: TDB

- 2021 – 2024 Vincenzo Nucci (Co-Supervisor)
  Topic: Self Adaptive systems and Machine learning (On-going)
- 2018 – 2021 Leonardo Vito (Co-Supervisor)
  Thesis Title: Designing and Implementing Data Science Pipelines in Healthcare and BiologicalApplications

CURRICULAR TEACHING ACTIVITIES

Over the years, I have received the following curricular teaching assignments specifically for the University of Camerino for the Degree Course in Computer Science, delivered in Italian language, of the Master's Degree Course in Computer Science, Mathematics and Applications and Physics, delivered in English language. In the academic years 2019-2020 and 2020-2021, I have been *Cultore della Materia* at the University of Macerata for teaching "Methods and Technologies for Teaching Mathematics." I have served as thesis advisor or co-advisor for several students' master's and bachelor's theses.

Anno accademico 2023-2024

- Fundamentals of Machine Learning (6 ETCS) - INF/01 - Master Degree in Computer Science (LM-18), Università di Camerino

Academic Year 2022-2023

- Fundamentals of Machine Learning (6 ETCS) - Master Degree in Computer Science (LM-18), University of Camerino
- Fundamentals of Machine Learning (6 ETCS) - INF/01 - Master Degree in Physics (LM-17), University of Camerino

Academic Year 2021-2022

- Machine Learning (3 ETCS) - INF/01 - Master Degree in Computer Science (LM-18), University of Camerino

Academic Year 2020-2021

- Machine Learning (3 ETCS) - INF/01 - Master Degree in Computer Science (LM-18), University of Camerino
- Metodi e tecnologie per l'insegnamento della Matematica (6 ETCS) - MAT/02, Master Degree in Science Education, University of Macerata (Cultore della Materia)
- Fondamenti di Data Analytics e Machine Learning - INF/01, Master Digital Solution Manager, University of Camerino

Academic Year 2019-2020

- Machine Learning (3 ETCS) - INF/01 - Master Degree in Computer Science (LM-18), University of Camerino
- Metodi e tecnologie per l'insegnamento della Matematica (6 ETCS) - MAT/02, Master Degree in Science Education, University of Macerata (Cultore della Materia)

Academic Year 2017-2018

- Algoritmi e strutture Dati- Lab (6 ETCS) - INF/01, Bachelor Degree in Informatica (L-31), University of Camerino

Academic Year 2014-2015

- Distributed Calculus and Coordination (DCC) (3 ETCS) - INF/01, Master Degree in Computer Science (LM-18), University of Camerino

Academic Tutor

Academic Year 2014-2015

- Reti Logiche - INF/01, Bachelor Degree in Informatica (L-31), University of Camerino

Master Degree (Supervisor)

- 2022 Tommaso Carletti - Title: A cycle basis approach to persistent homology computation
- 2022 Riccardo Coltrinari - Title: Neural Machine Translation: from Natural Language requirements to Linear Temporal Logic formulas
- 2022 Marco Scarpetta - Title: Online Anomaly Detection on streaming data
- 2022 Alessandro Antinori - Title: RAINFALL 2.0: A rapid and interactive framework for ML DataFlow generation applied to manufacturing scenarios
- 2022 Matteo Molteni - Title: Case-based recommender system for university elective courses
- 2021 Andrea Falaschini, Manuel Cretone - Title: CIAS - Clinical Intelligent & Adaptive System
- 2021 Giacomo Rocchetti - Title: Towards a new framework for real time self-adaptivity
- 2020 Simone Dominici - Title: xML through formal verification: A comparison among different strategies
- 2020 Vincenzo Nucci - Title: XTDA. A topological pipeline for understanding the behaviour of deep networks at global scale

Bachelor Degree (Supervisor)

- 2023 Andrei Stana - Title: Intelligenza Artificiale: la questione etica
- 2023 Fabio De Vitis - Title:U-Nets in Ancient Documents ICCU Digitalization
- 2021 Riccardo Fioretti - Title: Node-RED e DolphinNext: approccio al dataflow programming e casi d'uso
- 2019 Alberto Pompei - Title: Studio comparativo di modelli di Deep Learning
- 2019 Maria Curcio - Title: Algoritmi di ricerca informata - Applicazione nel Gioco del 15 di A* in Lua
- 2019 Giacomo Rocchetti, Alessandro Liscio - Title: Monitoraggio di anomalie comportamentali nei pazienti in fase di riabilitazione da traumi spinali
- 2019 Christian Zamparini - Title: Classificazione di ECG tramite CNN
- 2019 Luca Pretini - Title: Analisi di sequenze e Pattern recognition: il caso della ritenzione degli introni nello splicing dell'RNA
- 2019 Giovanni Santinelli - Title: Analisi di sequenze e Pattern recognition: il caso della ritenzione degli introni nello splicing dell'RNA

- 2019 Manuel Cretone, Emilio Silvestri - Title: CNN per la rilevazione di crisi epilettiche da dati sintetici
- 2018 Michael Vasquez Otazu - Title: CHoleR - Holes Researcher (C++ Tool for the Analysis of Persistent Homology on Undirected Weighted Graphs)
- 2018 Simone Morettini - Title: Reti HTM per il riconoscimento di Pattern
- 2018 Silvio Colaci - Title: MotionHunt -A motion detection system
- 2018 Matteo Imperato- Title: MotionHunt - A motion detection system

PROFESSIONAL EXPERIENCE

University of Camerino, Jan. 2023 - Present
Research fellow (area 01/B1- Computer Science), scientific area: INF/01 (Computer Science), University of Camerino, School of Science and Technology, Computer Science Division

University of Camerino, Feb. 2021- Dec. 2022
Winner of a postdoctoral research grant in the School of Science and Technology, entitled *"Modelling and studying Self-adaptive Cyber Physical Systems"*.

University of Camerino, Feb 2018 - Jan. 2021
Winner of a two-year post-doctoral research grant, renewed for a third year, from the School of Science and Technology, entitled *"Study and development of algorithms for the monitoring and prediction of changes in the psycho-physical state of patients in rehabilitation for spinal injuries"*.

University of Camerino, June 2017- Jan. 2018
Winner of a postdoctoral research fellowship in the School of Science and Technology, entitled *"Study and development of algorithms and methods for the analysis of streaming and / or batch data for prediction, classification and clustering"*.

SPIN-OFF

Founding member of UniCam spin-off Knoway Systems S.r.l. (https://www.knowaysystems.it). The company a team of more than 25 young IT graduates and proposes on the national market customized software solutions for the digitization of public administration and the development of Industry 4.0 in small and medium-sized enterprises. The company was born out of the activities of the e-government research group at the University of Camerino to give support to prototypes developed as part of research and technology transfer projects.

INSTITUTIONAL ASSIGNMENTS

- Representative of research fellows in the Council of the School of Science and Technology of the University of Camerino (Decreto ST 24/2021 del 7/5/2021 - termine 2023).

PF24

- Training planning, assessment and research - Pedagogy (6 ETCS)
- Cognitive, learning and development processes - Psychology (6 ETCS)
- Anthropology - Cultural anthropology (6 ETCS)
- Teaching methods and technologies - Special Pedagogy And Didactics Of Inclusion (6 ETCS)

Portorecanti, January 18, 2024 Marco Piangerelli, Ph.D