Emanuele Chini

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Driven, innovative, and passionate about tackling challenges. Currently pursuing a National Ph.D. in Artificial Intelligence at the University La Sapienza, in collaboration with the University of Verona and Giordano Controls, with a strong passion for addressing the explainability problem in AI. Highly ambitious, cheerful, and dependable, with a strong commitment to teamwork and achieving shared goals.

Education

University La Sapienza - Rome 2023 - Present
National Doctorate Program in Artificial Intelligence *Rome, Italy*

University of Verona (110/110 cum laude) 2021 - 2023
Master's Degree in Medical Bioinformatics *Verona, Italy*

University of Trento 2018 - 2021
Bachelor's Degree in Information Engineering and Business Organization *Trento, Italy*

Experience

Explainable Knowledge Distillation in Time Series 01/2025 – Present
Collaboration Research *Université Haute Alsace, Mulhouse, France*

- Ongoing research collaboration with Prof. Germain Forestier on the topic of Explainable Knowledge Distillation in Time Series, utilizing real-world datasets for practical applications.

Predictive Maintenance for HVAC Systems 11/2023 – Present
Intern *Giordano Controls, Verona, Italy*

- Developed form the ground up a pipeline that downloads data from cloud service, preprocessing them and analyse them with AI models.
- Utilized TensorFlow and PyTorch to develop custom AI algorithms and implemented state-of-the-art models from the literature.
- Achieved preliminary results in early anomaly prediction: 81% accuracy, 80% precision, and 81% recall.

Development of an Interface for OCR Data Integration with NLP Pipeline 06/2023 – 10/2023
Developer *University of Verona, Verona, Italy*

- Collaborated with Prof. Pietro Sala to develop a Flutter application connecting OCR-processed data with an NLP pipeline.

Integration of BPMN Engine in a Breast Cancer Care Management 04/2023 – 06/2023
Intern *Fondazione Bruno Kessler, Trento, Italy*

- Optimized the definition of the breast cancer care process modeled with BPMN 2.0.
- Integrated the BPMN engine between the TreC platform and the Camunda engine to enhance process management.

Publications

Explaining Strategies for Expected Impacts | Information Systems (2025)

- **Currently under second-round review after incorporating reviewers feedback.**
- **Abstract**: This paper introduces BPMN+CPI, an extension of BPMN that integrates choices, probabilities, and impacts, with formal semantics defined via Synchronous Probabilistic Impactful Networks (SPIN). It addresses strategy synthesis to keep expected impacts within thresholds, proving PSPACE complexity, proposing an efficient algorithm with heuristics, and introducing explainability through embedded decision trees, validated on synthetic BPMN processes. Extension of *Reactive Synthesis for Expected Impacts*.
- **Keywords**: *BPM*, *Expected Impacts*, *Reactive Synthesis*, *Policy Interpretation*
- **Authors**: Daniel Amadori, Emanuele Chini, Pietro Sala, and Omid Zare

Time Series Step Tree: A Novel Interpretable Method for Prompt Classification of Time Series | The 8th International Conference on the Dynamics of Information (2025)

- **Accepted for publication, expected summer 2025.**

- **Abstract**: Presented Time Series Step Tree (TSST), a novel and interpretable method for efficient time series classification using a step-wise evaluation with dynamic observation windows. TSST constructs decision trees with a unique *witness time series* selection process, ensuring both high accuracy and timely classification while maintaining transparency.
- **Keywords**: *Prompt time series classification*, *Interpretability*, *Decision tree*, *Univariate time series*, *Early time series classification*
- **Authors**: Omid Zare, Pietro Sala, Daniel Amadori, Emanuele Chini, and Javad Hassannataj Joloudari

Reactive Synthesis for Expected Impacts | 15th International Symposium on Games, Automata, Logics, and Formal Verification (2024)

- **Abstract**: Introduced a formal extension of BPMN incorporating choices, probabilities, and impacts (CPI) to optimize business processes. It addresses strategy synthesis to keep expected impacts within thresholds, proving PSPACE complexity, proposing an algorithm featuring automatas.
- **Code:** GitHub Repository: https://github.com/ansimonetti/PACO
- **DOI:** https://doi.org/10.4204/EPTCS.409.7
- **Keywords**: *Business Process Management*, *Expected Impacts*, *Reactive Synthesis*
- **Authors**: Emanuele Chini, Pietro Sala, Andrea Simonetti and Omid Zare

A Migration Framework for Active BPMN Processes in Healthcare | 12th IEEE International Conference on Healthcare Informatics (2024)

- **Abstract**: Proposed a framework for migrating BPMN processes in healthcare, integrating compensatory strategies based on users' completion status and a color-coded risk classification system. The framework is applied to an ERAS-inspired prehabilitation program for pancreatic surgery at the Verona Pancreas Institute.
- **DOI:** 10.1109/ICHI61247.2024.00050
- **Keywords**: *BPMN*, *BPMN Framework*, *Agile Methodology*, *Migration*, *Versioning*
- **Authors**: Matteo Mantovani, Emanuele Chini and Carlo Combi

Projects

BPM Based Web Application to Support Activities for Patients Waiting For Pancreatic Surgery 10/2022 - 09/2023

- Led the full-stack development of a patient support application for pancreatic surgery, utilizing Angular for the front-end and the Camunda BPM engine for the backend.
- Optimized 5 BPMN processes to enhance the application efficiency.
- Leveraged Docker for improved deployment and scalability, and optimized Client-Server synchronization to significantly enhance performance and user experience. Completed as part of my Master's thesis project.
- **Technologies:** Angular, Camunda Engine 2.0, Docker, API

Development of a Mobile Application for Verbal Apraxia Rehabilitation 06/2021-12/2021

- Collaborated with Neurocognitive Rehabilitation Center (CERIN) to develop an application for verbal apraxia rehabilitation. Acted as a liaison between the University and CERIN, facilitating effective communication and collaboration. Completed as part of my Bachelor's thesis.
- Developed an Android application from the ground up that integrates machine learning (ML) algorithms to evaluate and score mouth movements during rehabilitation exercises.
- **Technologies**: Android Studio, Google ML, Relational Database

Other Activities

Information and Computation Journal 02/2025 – Present

Reviewer

- Reviewed and evaluated 1+ articles for clarity, accuracy, and adherence to publication standards and guidelines.

Technical & Soft Skills

Languages: Python, Java, TypeScript, R, Dart
Technologies: Angular, Flutter, TensorFlow, PyTorch, Flask, Docker, Android SDK, GitHub
Concepts: Artificial Intelligence, Machine Learning, Neural Networks, API, Database, Agile Methodology
Soft Skills: Teamwork, Time Management, Autonomy, Flexibility, Adaptability, Attention to Detail, Problem-Solving, Organizational Skills, and Initiative

Languages

Italian: Native – **English**: Intermediate (B2) – **German**: Basic (A2) – **French**: Basic (A2)