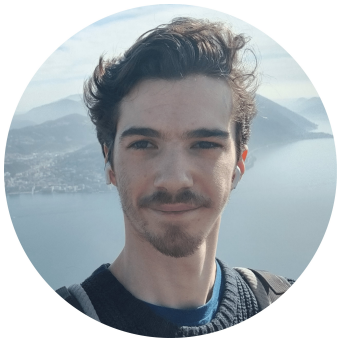

Giovanni De Felice

Ph.D. Candidate

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giovanni-de-felice
gdefe

Languages

Italian - Native
English - Professional
French - Basic

Skills

Programming: Python, Matlab, C++, Bash, Root

Libraries: Numpy, Pandas, Geopandas, Pytorch, CUDA, P. Geometric, P. Lightning, Torch Spatiotemporal, tslearn, sktime, sklearn, GPytorch, W&B, Hydra, Matplotlib, Plotly, ...

Miscellaneous: Git, LaTeX, Draw.io, MS Windows, MS Office, MacOS

Short Bio

I am a last-year Ph.D. candidate in the 'Data Mining & Machine Learning group' at the University of Liverpool (UK). My research focuses on:

- **Spatio-Temporal processing:** forecasting, virtual sensing, unc. quantification; gaussian processes, spatio-temporal graph neural networks.
- **Time Series:** forecasting, representation, kernels, underlying dynamics; recurrent neural networks, reservoir computing.
- **Graph Deep Learning:** sensor networks; graph neural networks.
- **Applications:** climate, renewable energy output, material weathering.

Education

2020 - Ong. **Ph.D. candidate** in Computer Science
University of Liverpool, Liverpool (UK)
- Machine learning for spatio-temporal data.
- Time series analysis.
- Applications in the natural sciences.

2018 - 2020 **Master of Science (M.Sc.)** in Particle Physics
University of Pisa, Pisa (Italy)
Final grade: 110/110 cum Laude, GPA: 29.5/30
- Experimental particle physics.
- Statistical data analysis.
- Quantum field theory and group symmetries.

2015 - 2018 **Bachelor of Science (B.Sc.)** in Physics
University of Pisa, Pisa (Italy)
Final grade: 109/110, GPA: 26.9/30

2010 - 2015 **High School** in Mathematics and Science
Scientific Lyceum Ignazio Vian, Bracciano (Italy)
Final grade: 100/100

Internships

Ong. **Research visit**, Graph Machine Learning Group (Prof. C. Alippi)
Swiss AI lab IDSIA & USI, Lugano (Switzerland)
- Graph deep learning for time series and spatio-temporal data.
- Uncertainty quantification and OOD detection.

2020 **DOE-INFN Summer Intern** (Dr. R. H. Bernstein)
Fermilab, Batavia, IL (USA)
- Improved cross-section model for antiproton production.
- Antiproton background in the Mu2e beamline.

2020 **HASCO Summer School** (Prof. A. Quadt)
University of Goettingen, Goettingen (Germany)
Final grade: 'A' with special mention
- Advanced lessons on frontier topics in particle physics.

Talks

- **Invited talk** at *'Temporal Graph Reading Group' (Mar 2024, Virtual).*
  Presentation of the paper: "Graph-based Virtual Sensing from Sparse and Partial Multivariate Observations".
- **Invited talk** at Beckers group (Nov 2023).
  Invited to present my work to the Executive Management team of the Beckers Group.
- **Invited talk** at *'Machine Learning Applications for Chemical Materials Development and Discovery'* (Jan 2022, University of Liverpool). Invited to present my work on material weathering predictions.
- **Invited talks** at two *Mu2e Collaboration Meetings* (Oct 2020 and Jun 2020, Virtual).
- **Poster presentations** at PGR Workshop (Univ. of Liverpool), NeurIPS 2022 (New Orleans), NeurIPS 2023 (New Orleans), ICLR 2024 (Vienna).

Publications

Machine Learning:

- **Graph-based Virtual Sensing from Sparse and Partial Multivariate Observations**
  G. De Felice, A. Cini, D. Zambon, V. Gusev, C. Alippi.
  The Twelfth International Conference on Learning Representations (ICLR). 2024.
- **Time Series Kernels based on Nonlinear Vector AutoRegressive Delay Embeddings**
  G. De Felice, J. Y. Goulermas, and V. Gusev.
  Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS). 2023.
- **Spatio-Temporal Weathering Predictions in the Sparse Data Regime with Gaussian Processes**
  G. De Felice, V. Gusev, J. Y. Goulermas, M. Gaultois, M. Rosseinsky, C. Gauvin,
  AI for Science: Progress and Promises (NeurIPS Workshop). 2022.

Physics:

- **Mu2e Run I Sensitivity Projections for the Neutrinoless $\mu^- \to e^-$ Conversion Search in Aluminum**
  Mu2e Collaboration,
  Universe, 9(1), p.54. 2023.
- **An updated estimate of the Mu2e experiment sensitivity**
  G. De Felice,
  Master's degree thesis. 2020.

Materials Informatics:

- **Enhancing Extrapolation in Materials Science through Contrastive Learning of Chemical Compositions**
  O. Federico, **G. De Felice**, R. Savani, V. Gusev, and M. Rosseinsky.
  AI for Accelerated Materials Design (NeurIPS Workshop). **Spotlight**. 2023.
- **Not as simple as we thought: a rigorous examination of data aggregation in materials informatics**
  O. Federico, **G. De Felice**, V. Gusev, and T. Sparks.
  Digital Discovery, 3 (2), p.337-346. 2023.

Industrial Projects

2020 - 2024 **Weathering Predictions of Paint Formulations**, in partnership with **Beckers Group**.
Beckers Group / University of Liverpool
- Predict long-term performances in untested locations from climatic data.
- Extract formulatory information from data.

Awards

- **Spotlight paper** at the *AI for Accelerated Materials Design* (NeurIPS 2023 Workshop).

Program Committee Member

- **Reviewer** for *'Computational Materials Science'* journal.

Other Interests

Music and Classical Piano: I started playing the piano when I was 8 yo, reached a high conservatory level and it still constitutes a central part of my life.

- Classical Piano Degree Admission ($\sim 8^{th}/10$ year exam)
  Higher institute of musical studies Pietro Mascagni, Livorno, Italy. Grade: 8/10 **(2nd place)** (2015)
- Mid-term exam ($5^{th}/10$ year exam)
  Conservatory Alfredo Casella, l'Aquila, Italy. Grade: 9/10 (2013)
- Solfeggio and theory of music
  Conservatory Nino Rota, Monopoli, Bari, Italy (2011)
- GRADE 1 exam
  The Associated Board of the Royal Schools of Music, Varese, Italy. Grade: pass with distinction (2007)
- Other: Alto Saxophone (2022-Ong.), keyboard live concerts in Italy and France (2013-2015), pianist in a theater-dance spectacle (2014), orchestra and chamber music (2010-2015).

Other interests and activities:

- Sports: I love and practice Swimming, Basketball, Skiing, Fishing, and Mountain Hiking;
- Voluntary: I participated as a voluntary in multiple Special Olympics Italia events;
- Computer assembly: I love following the development of PC hardware and assembling desktops.

9th July 2024

Giovanni De Felice