ENRIQUE CRESPO FERNÁNDEZ

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AI Researcher specializing in the intersection of Deep Learning and Formal Reasoning. Currently a PhD candidate developing neuro-symbolic methods that leverage program synthesis to enable online learning and logical inference. I hold a strong mathematical foundation in Mathematics and Theoretical Physics, which informs my work on interpretability and generalization beyond statistical correlation through program synthesis. Proficient in logic programming, I am dedicated to moving beyond "black box" models by integrating structured knowledge representations into autonomous agents. Outside my main research area, I have experience in deep learning, particularly in sequence modeling and physics-informed neural networks. I am seeking a research role that demands rigorous theoretical understanding and the ability to innovate at the fundamental architectural level.

EXPERIENCE

University of Bristol *Teaching Assistant - Bristol, UK* *2024-2025*

- Data Science Project Unit - Supervised and mentored postgraduate Data Science students on industry-sponsored group projects, guiding research design, experimentation, and reporting. Acted as the primary liaison between student teams and corporate partners, ensuring timely delivery of project milestones and clear communication of technical findings.
- Machine Learning Unit - Assisted in delivering lectures and practical sessions on machine learning topics to undergraduate Computer Science students. Provided one-on-one support during lab sessions, helping students understand complex concepts and debug code.
- Artificial Intelligence Unit - Supported the teaching of symbolic AI fundamentals as well as multi-agent systems to third-year Computer Science undergraduates.

Lukkap *Data Scientist Intern - Madrid, Spain* *2021-2022*

- Built an end-to-end machine-learning pipeline to process and analyse open-ended survey responses, integrating clustering, tree-based models, and NLP sentiment analysis; cut analysis time from days to minutes.
- Developed a psicometric model and analysis pipeline from the ground up to extract personality traits from employee survey data, enabling HR teams to better understand workforce dynamics. Opening a new revenue stream for the company.
- Presented insights to stakeholders and delivered training sessions enabling non-technical colleagues to use the analysis tools independently.

EDUCATION

University of Bristol *PhD in Artificial Intelligence - Bristol, UK* *2024-2027 (expected)*

- Supervisor: Prof. Peter Flach.
- Research: Neuro-symbolic methods for explainable and generalisable agents.
- My day to day research focuses on leveraging structured reasoning to build autonomous agents that can learn and adapt online.

University of Bath *BSc Mathematics and Physics (First-Class Honours) - Bath, UK* *2019-2023*

- Dissertation: Classifying dangerous sea-wave events from radar scans with CNNs - in collaboration with the Met Office (71%).
- Notable modules: Quantum mechanics (88%), General relativity (71%), Analysis 2 (85%), Algebra 2 (81%).
- Overall final grade: 72%.

PUBLICATIONS

Weight-Space Linear Recurrent Neural Networks *ICLR, 2026*

Roussel Desmond Nzoyem, Nawid Keshtmand, Enrique Crespo-Fernandez, et al. [Link]

Continual learning and refinement of causal models through dynamic predicate invention *ARXIV, 2026*

Enrique Crespo-Fernandez, Oliver Ray, Telmo de Menezes e Silva Filho, Peter Flach [Link]

SIDE PROJECTS

Peptide deep sequencing analysis tool *Python* *2024*

- Engineered a high-throughput bioinformatics pipeline to process raw peptide deep-sequencing data, automating previously manual alignment tasks.
- Optimized data ingestion and visualization workflows, significantly reducing analysis latency and enabling the interpretation of complex sequencing datasets.

Gniiam (Restaurant Tech Platform) *React, Node.js, MongoDB* *2023-2024*

- Co-founded a full-stack distributed system for real-time order management, via QR-code endpoints.
- Built customer-facing ordering interface and analytics dashboard.

SKILLS

- **Programming Languages:** Python, Prolog, ASP, C, JavaScript
- **Data Science and Machine Learning:** Deep-learning architectures (Pytorch), ML algorithms, logic-based systems, program synthesis, NLP techniques

ADDITIONAL INFORMATION

Languages: English (fluent), Spanish (native).
Interests: Learning Theory, Theoretical Physics, Category Theory, History and road cycling.