

Alejandro Hernandez Artiles

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Research Summary

ELLIS PhD student at the Max Planck Institute for Human Development and Max Planck Institute for Intelligent Systems, co-supervised by Prof. Iyad Rahwan and Prof. Bernhard Schölkopf. My work explores open-ended AI systems for cultural and scientific discovery, inspired by cultural evolution to enable continuous creative exploration beyond mode collapse. I am interested in developing computational methods that autonomously discover and generate infinitely interesting artifacts in domains lacking clear reward signals, such as early-stage scientific ideation.

Selected Publications

The Alien Space of Science: Sampling Coherent but Cognitively Unavailable Research Directions

NeurIPS 2026, Main Track

A. H. Artiles, M. Weiss, L. Brinkmann, I. Rahwan, B. Schölkopf, C. Pal, H. Larochelle, A. Goyal, N. Rahaman.

Developed a method for sampling scientifically coherent research directions beyond the ideas most likely to arise from existing research communities; evaluated on 16,068 LLM papers.

Cultural Alien Sampler: Open-ended Art Generation Balancing Originality and Coherence

NeurIPS 2025, Creative AI Track

A. H. Artiles, H. Yakura, L. Brinkmann, M. Canet Sola, H. Abu Alhaija, I. Serna, N. Rahaman, B. Schölkopf, I. Rahwan.

Designed a concept-sampling method that balances originality and coherence; evaluated with 100 participants and compared with GPT-4o and human art students.

Time Machine Experiments: Using Historically-Bounded AI for Inquiry into the Human Mind

arXiv preprint, 2026

H. Yakura*, R. Schimmelpfennig*, E. Lopez-Lopez*, **A. H. Artiles**, L. Brinkmann, J.-F. Bonnefon, A. Shariff, I. Rahwan.

Research Experience

Tiptree Systems

March 2026 – October 2026

Research Intern — AI for Scientific Discovery

- Led research on *The Alien Space of Science*, developing a method to identify coherent research directions that fall outside familiar conceptual trajectories. Related publication in NeurIPS 2026 Main Track.
- Contributed to *Lacuna*, a research map linking machine-learning papers, concepts, directions, and proposals.

Max Planck Institute for Human Development

February 2024 – Present

ELLIS PhD Student; previously Visiting Researcher — Berlin, Germany

- Conduct research on open-ended AI for cultural and scientific discovery in collaboration with the Max Planck Institute for Intelligent Systems.

- Developed the Cultural Alien Sampler, published in the NeurIPS 2025 Creative AI Track, to generate original yet coherent art concepts.
- Co-authored *Time Machine Experiments*, a preregistered study of how interaction with a historically bounded language model changes perceptions of moral decline.

Vicomtech, Applied Research Center

October 2024 – Present

Research Assistant — San Sebastián, Spain

- Conduct research on vision-language models (VLMs) as agentic systems for autonomous vehicle applications across EU projects.
- Developed a zero-shot in-cabin safety-monitoring system using VLM agents for passenger tracking and out-of-distribution risk detection.
- Designed VLM-assisted annotation workflows, reducing human annotation time by over 50%.

CSIC, Spanish National Research Council

February 2023 – September 2023

Research Intern — Madrid, Spain

- Investigated connections between neuroscience and artificial neural networks, focusing on how hippocampal neurons process multimodal concepts.
- Analyzed latent representations in VAEs, VQ-VAEs, Transformers, and CLIP as a foundation for computational studies of creativity.
- Awarded a competitive JAE Research Fellowship.

Bank of Spain

October 2022 – February 2023

AI Engineer Intern, Department of Innovation — Madrid, Spain

- Developed AI solutions for robotic process automation.

Education

PhD in Artificial Intelligence (ELLIS / MP-AIX)

2026 – Present

Max Planck Institute for Human Development / Max Planck Institute for Intelligent Systems

Co-supervisors: Prof. Iyad Rahwan and Prof. Bernhard Schölkopf.

Research focus: Open-ended AI systems for cultural and scientific discovery.

Master's degree in Computer Science

2022 - 2024

Technical University of Munich & Universidad Carlos III de Madrid

GPA: 8.9/10

Master's thesis (10/10, First Class): Alien Recombination: Exploring Concept Blends Beyond Human Cognitive Availability in Visual Art (Supervisor: Prof. Niki Kilbertus, TUM).

Subsequent extended work published in NeurIPS 2025 proceedings (Creative AI Track).

Bachelor's degree in Computer Science

2018 - 2022

Universidad Carlos III de Madrid

Bachelor's thesis (10/10, First Class): Study and development of the algorithm Neuroevolution of Augmented Topologies in the Pac-man environment (Supervisor: Prof. Jose Antonio Iglesias).

Awards and Honors

MP-AIX Scholarship

Awarded doctoral funding through the competitive Max Planck Artificial Intelligence Network (MP-AIX).

JAE Research Fellowship, CSIC

Competitive research grant for high-achieving students given by the Spanish National Research Council.

Spanish Government Excellence Scholarship

Awarded 25,000€ by the Spanish Ministry of Education for academic excellence and demonstrated financial need at both the Bachelor's and Master's levels.

Erasmus+ Scholarship

Awarded the exclusive university exchange spot to study at the Technical University of Munich, along with a 5,500€ scholarship.

Publications

Lacuna: A Research Map for Machine Learning

AI4Science Workshop, ICML 2026

M. Weiss, M. Q. Li, **A. H. Artilles**, Y. Mkhinini, C. Pal, H. Larochelle, N. Rahaman.

Exploring Visual Language Models for Driver Gaze Estimation: A Task-Based Approach to Debugging AI

Computer Vision and Image Understanding, 263:104593, 2026

P. N. Cañas, **A. H. Artilles**, M. Nieto, I. Rodríguez.

Selected Talks

New Approaches to Zero-Shot Learning

2023

Institute of Physics of Cantabria (IFCA, CSIC-UC)

Research seminar on high-dimensional information encoding in deep learning models and recent advances in zero-shot capabilities.