THIAGO FREITAS DOS SANTOS, PhD.

Postdoctoral Researcher in AI | Human-Centered AI · Neuro-Symbolic AI · Multimodal & GenAI
Languages: Portuguese (native), English (fluent), Spanish (fluent), French (fluent)
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EDUCATION

Ph.D. (Cum Laude) in Artificial Intelligence, Autonomous University of Barcelona, Spain	2020 – 2024
MSc. in Artificial Intelligence, University Center of FEI, Brazil	2017 – 2019
BSc. (Honours) in Computer Science, University Center of FEI, Brazil	2011 – 2016
BSc. Exchange Program in Computer Science, University of Galway, Ireland	2014 – 2015
IT Technician, ETEC Diadema, Brazil	2009 – 2010

RESEARCH EXPERIENCE

Postdoctoral Researcher with Prof. Nadia Magnenat-Thalmann 2024 – Present
MIRALab, University of Geneva, Switzerland
Projects: ENIGMA (EU Funded), Eureka3D-XR (EU Funded), IDS (Innosuisse Funded), Social Robotics

- **ENIGMA** - AI for Cultural Heritage Protection and Reconstruction: Develop AI methods for analyzing, segmenting, and reconstructing damaged CH objects from 2D images. Work includes damage detection, missing-part estimation, shape-informed segmentation, GenAI CH object repair, and 3D reconstruction pipelines for damaged artefacts.
- **EUreka3D-XR** — 3D/XR Cultural Heritage Experiences: Contribute to the development of AI-supported and XR-oriented CH workflows, including multimodal visualization, automatic reconstruction, AI-based generation, and integration of CH expert knowledge.
- **IDS**: Support the research activities of a Ph.D. Student. Contribution to the scientific development of AI-assisted surgical training, preparation of ethics committee procedures, co-design experimental protocols, user studies and dataset acquisition with medical students.
- **Social Robotics**: Support the research activities of a Ph.D. Student. Contribute to the design and analysis of human–robot interaction studies investigating social robot behavior, LLM-driven interaction, and user engagement. Co-design experimental studies, perform statistical analyses of behavioral and questionnaire data, analyze conversational interactions.

Ph.D. Student with Dr. Nardine Osman and Dr. Marco Schorlemmer 2020 – 2024
Artificial Intelligence Research Institute (IIIA-CSIC) / Autonomous University of Barcelona, Spain
WeNet project — European Union Horizon 2020

- Investigated incremental learning approaches to continuously learn the meaning of norm violations in a context with concept drift, imbalanced dataset, and low-resource communities.
- Understood how communities define the meaning of norm violations through interpretability of deep learning models and explained to agents (community members) parts of an action associated with such behavior. Conduct user study to evaluate XAI approaches.

Visiting Ph.D. Researcher with Prof. Stephen Cranefield and Prof. Tony Savarimuthu 2022
University of Otago, New Zealand

- Investigated cross-community learning with adapters and transformer-based language models, using norm violation definitions from different sources (communities) to improve the performance in a new target community.

Graduate Student (MSc.) with Prof. Paulo Eduardo Santos 2017 - 2019
University Center of FEI, Brazil | FAPESP-funded.

- Investigated the knowledge representation and reasoning methods related to solving a family of spatial puzzles composed of rigid objects, flexible strings, and holes.
- Incorporated heuristics as a mechanism to accelerate the learning process of an ML algorithm that combines reinforcement learning and answer set programming.

Summer Research Project with Prof. Enda Howley 2015
University of Galway, Ireland | CAPES-funded
- Learned about scientific projects using reinforcement learning and Arduino, exploring ML algorithms with application to robotics.

Scientific Initiation Program with Prof. Plinio Thomaz Aquino Jr. 2012 - 2014
University Center of FEI, Brazil | CNPQ-funded
- Learned about basic scientific research, focusing on how to work on an investigation project.
- Studied the interaction and usability techniques with the dog robot AIBO, understanding how users feel when interacting with it.
- Developed an application to remotely control the dog robot using Kinect to read gestures.

RESEARCH GRANT & PROPOSAL DEVELOPMENT

- Lead the scientific development of multi-partner European R&D proposal, including technical positioning, research objectives, work-package and task design, partner roles, use cases and pilots, responsible AI/ethics, impact, exploitation, and consortium integration.
- Submitted Proposals: **HORIZON-CL4-2025-03-HUMAN-15** (EU, evaluation score: 12.5); **HORIZON-CL4-2026-04-HUMAN-01** (EU, evaluation score: 13.0); **PATHFINDER** (EU, evaluation score: 13.4).

INDUSTRY EXPERIENCE

- **System Analyst** – Everis, Brazil. Full-Stack .NET development for banking clients. 2019
- **Web Developer** – Cognizant, Brazil. Technical Leader & Full Stack Developer. 2016 – 2017
- **Web Developer** – Class Solutions, Brazil. Full-Stack Developer (Sharepoint). 2015 – 2016
- **Web Developer Intern** Animatech, Brazil. ASP.NET MVC Developer. 2012

SCHOLARSHIPS AND ACHIEVEMENTS

- Ph.D. Distinction - Cum Laude
- FAPESP Scholarship for Master studies.
- CAPES Scholarship to study abroad (exchange program) at the University of Galway.
- PROUNI Scholarship to study at the University Center of FEI.
- Government funding (CNPQ) for the Scientific Initiation project.
- Bachelor's degree as first in the student rank in my class.
- Microsoft Certified Professional. Microsoft 70-483 C#.NET.

TECHNICAL & RESEARCH SKILLS

- **AI & Machine Learning:** Human-Centered AI, Deep Learning, Computer Vision, Multimodal AI, Generative AI, Explainable AI, Continual Learning, Reinforcement Learning.
- **Knowledge Representation & Reasoning:** Answer Set Programming, symbolic reasoning, Prolog, neuro-symbolic AI.
- **3D/XR:** 3D reconstruction, XR/VR research systems, Unity-based prototyping.
- **Programming:** Python, C#, Java, Kotlin, JavaScript, ASP/.NET.

ACADEMIC SERVICE

- **Organizing Committee:** International Conference on Computer Animation and Social Agents – Extended Reality (CASA-XR), 2026; Computer Graphics International (CGI), 2024.
- **Peer Reviewer:** AAAI 2027; NeurIPS 2026; ACMMM 2026; IJCAI 2025; AAMAS 2024–2025; Applied Intelligence 2023–Present; IEEE Access 2023; CCIA 2023.

SELECTED PUBLICATIONS

- **Freitas dos Santos, Thiago**, & Magnenat-Thalmann, N. (2026). Preserve my Heritage: A Shape-Informed Neural Framework for Damage Analysis and Segmentation in Cultural Artifacts. In *ACM Journal on Computing and Cultural Heritage (JOCCH) - under revision*.
- Ma, L., **Freitas dos Santos, Thiago**, Magnenat-Thalmann, N., & Wac, K. (2026). SHands: A Multi-View Dataset and Benchmark for Surgical Hand-Gesture and Error Recognition Toward Medical Training. In *Conference on Computer Vision and Pattern Recognition (CVPR 2026).*
- Kang, H., **Freitas dos Santos, Thiago**, Ben Moussa, M., & Magnenat-Thalmann, N. (2025). From Sci-Fi to Reality: Exploring Teenagers' Perceptions and Ideas of AI Robots. *The Visual Computer*, 41(13), 11629–11640.
- **Freitas dos Santos**, **Thiago**, Osman, N., & Schorlemmer, M. (2024). Is This a Violation? Learning and Understanding Norm Violations in Online Communities. *Artificial Intelligence Journal.*
- **Freitas dos Santos**, **Thiago**, Osman, N., & Schorlemmer, M. (2024). Can Interpretability Layouts Influence Human Perception of Offensive Sentences? In EXTRAAMAS 2024.
- **Freitas dos Santos**, **Thiago**, Cranefield, S., Savarimuthu, B.T. R., Osman, N., & Schorlemmer, M. (2023). Cross-community Adapter Learning (CAL) to Understand the Evolving Meanings of Norm Violation. In *Joint Conference on Artificial Intelligence (IJCAI) 2023*.
- **Freitas dos Santos**, **Thiago**, Osman, N., & Schorlemmer, M. (2023). A Multi-scenario Approach to Continuously Learn and Understand Norm Violations. *Journal of Autonomous Agents and Multiagent Systems*, 1-57.
- **Freitas dos Santos**, **Thiago**, Osman, N., & Schorlemmer, M. (2022). Ensemble and Incremental Learning for Norm Violation Detection. In *Proceedings of the 21st International Conference on Autonomous Agents and Multiagent Systems.* 427-435.
- **Freitas dos Santos, Thiago**, Santos, P. E., Ferreira, L. A., Bianchi, R. A., & Cabalar, P. (2022). Heuristics, Answer Set Programming and Markov Decision Process for Solving a Set of Spatial Puzzles. *Applied Intelligence Journal*, 1-23.
- **Freitas dos Santos**, **Thiago**, Osman, N., & Schorlemmer, M. (2022). Learning for Detecting Norm Violation in Online Communities. In *Coordination, Organizations, Institutions, Norms, and Ethics for Governance of Multi-Agent Systems XIV: International Workshop, COINE 2021, Revised Selected Papers.* 127-142.
- Ferreira, L. A., **Freitas dos Santos, Thiago**, Bianchi, R. A., & Santos, P. E. (2019). Solving Safety Problems with Ensemble Reinforcement Learning. In *AI 2019: Advances in Artificial Intelligence: 32nd Australasian Joint Conference.* 203-214.
- **Freitas dos Santos, Thiago**, Santos, P., Ferreira, L., Bianchi, R., & Cabalar, P. (2018). Solving a Spatial Puzzle Using Answer Set Programming Integrated with Markov Decision Process. In *7th Brazilian Conference on Intelligent Systems (BRACIS)*. 528-533.
- **Freitas dos Santos, Thiago**, de Castro, D. G., Masiero, A. A., & Aquino Junior, P. T. (2014). Behavioral Persona for Human-Robot Interaction: A Study Based on Pet Robot. In *Human-Computer Interaction: 16th International Conference, HCI International 2014.* 687-696.