Antoine Oger

PhD Candidate in Human-Computer Interaction

Arts et Métiers Institute of Technology, LAMPA - PI Team

antoine.oger@ensam.eu +33 6 25 34 66 81 LinkedIn Profile

Research Profile / Summary

PhD candidate in Human-Computer Interaction specializing in the study of LLM-based virtual agents in real-world educational contexts. My research combines technical architecture design (facial animation, LLMs) and experimental evaluations in school settings to understand how agent interactivity and design influence student engagement, interest, and critical perception. I am particularly interested in assessing and mitigating the illusion of understanding induced by these technologies. I also apply my knowledge of generative AI through teaching activities and organizing educational events.

Research Interests

- Human-Computer Interaction (HCI)
- Artificial Intelligence in Education (AIED)
- Conversational Agents / Pedagogical Virtual Agents
- Large Language Models (LLMs) in Interaction, Prompt Engineering
- Generative AI Applications (Text, Image, 3D, Voice)
- Human Learning, Metacognition, Critical Thinking
- Illusion of Understanding / Illusion of Explanatory Depth
- In-the-Wild Evaluation / Field Research in Schools
- Agent Facial Animation / Non-verbal Behavior

Academic Background

PhD in Human-Computer Interaction

Arts et Métiers Institute of Technology

LAMPA Laboratory - Presence & Innovation (PI) Team
Start Date: November 2022 – Expected Defense: December 2025
Provisional Title: Student-AI Virtual Agent Interaction in Educational Contexts: Influence of Design on Interest, Engagement, and Metacognitive Processes.
Supervisors: Dr. Sylvain Fleury, Dr. Geoffrey Gorisse, Dr. Olivier Christmann
Research Topic: My doctoral research explores the multidimensional impact of LLM-based conversational agents on students in learning situations. Firstly, I investigated how key design factors – interactivity (dialogue vs. passivity) and agent representation (historical figure vs. neutral, presentation style) – significantly modulate student interest in the pedagogical activity, historical content, and the virtual character itself, with varying effects depending on the school level (middle/high school). This work, subject to publications, establishes the tangible influence of design on the student's subjective experience. Secondly, my research delves into the underlying metacognitive mechanisms. I aim to understand how agent properties (anthropomorphism, social cues via animation/voice, LLM response fluency) interact with the student's subjective perception of understanding, specifically investigating the phenomenon of the illusion of explanatory depth. The hypothesis is that certain designs, by increasing perceived credibility, might exacerbate this illusion. I use an experimental approach in classroom settings, combining behavioral measures, self-assessments (interest, metacognition), and objective performance to analyze these complex dynamics and inform the design of AI agents that foster both engagement and critical learning. Development and use of the MemorIA supporting technical architecture.

Research Master's Degree in Management of Interactive 3D Technologies (MTI3D)

Arts et Métiers Institute of Technology, Laval Institute

Graduated: September 2022
Research-focused training covering methods and technologies of Extended/Virtual Reality (XR), real-time 3D interaction, simulation, rapid prototyping (3D printing), and management of technology projects.

Research Experience

PhD Researcher / Doctoral Candidate

Arts et Métiers, LAMPA, Laval/Changé

| November 2022 – Present

- Designing, developing, and evaluating interactive virtual agents (LLMs, voice synthesis, facial animation) for history education.
- Setting up and conducting experimental studies in school settings (middle school, high school) comparing the impact of agent interactivity and design.
- Analyzing data on student interest, engagement, and illusion of understanding.
- Developing technical architectures (GPT-4, ElevenLabs, NVIDIA Audio2Face, FOMM).
- Writing scientific papers and ethics protocols.
- Collaborating with teachers and educational institutions.

Publications

International Journal Articles (Submitted / Under Review)

- Oger, A., Gorisse, G., Fleury, S., Bondesan, P., Christmann, O. (Submitted). The Influence of AI-Based Virtual Agents' Interactivity and Representation on Students' Interest in History.
  International Journal of Child-Computer Interaction

  .

International Conference Papers (Peer-Reviewed, Submitted / Accepted)

- Oger, A., Gorisse, G., Fleury, S., Bondesan, P., Christmann, O. (Submitted). MemorIA, an Architecture for Creating Interactive AI Historical Agents in Educational Contexts.
  Computer Animation and Virtual Worlds (CAVW 2025)

  .

Protocols / Technical Reports

- Oger, A., Fleury, S., Gorisse, G., Christmann, O. (2024). Research Protocol: Study of the influence of AI-powered virtual agent design on the illusion of understanding among middle school students. Arts et Métiers Research Ethics Committee.

Oral Presentations and Posters

- Oger, A., Gorisse, G., Fleury, S., Bondesan, P., Christmann, O. (Accepted/Scheduled). MemorIA, an Architecture for Creating Interactive AI Historical Agents in Educational Contexts. Oral presentation at the *CASA 2025 conference*, Strasbourg, France, July 1st, 2025.

Teaching & Supervision Experience

Lecturer (Module: Introduction to Generative AI)

Arts et Métiers Institute of Technology, Angers Campus

| 2024-2025 | 42 hours

Designed and delivered a course for 3rd-year engineering students on uses, practices, limits, prompt engineering, LLMs, text-to-speech/image/3D models, including familiarization with the Hugging Face ecosystem.

Lecturer (Module: 3D Printing)

Arts et Métiers Institute of Technology, Laval Institute

| 2022-2025 | 24 hours

Theoretical and practical course on 3D printing technologies and applications (Level: 1st Year Research Master's MTI3D).

Teaching Supervisor (AI/VR Project)

École Nationale Supérieure d'Arts et Métiers (ENSAM)

| 2023 (1st year PhD)

Technical and methodological supervision of a student team for the rapid design and development (2 weeks) of a Virtual Reality application within the RV Team Competition framework.

Academic Activities / Event Organization

Organizing Committee Member & Reviewer

Doctoriales Laval Virtual (European XR Event)

| 2023-2024 (2nd & 3rd year PhD)

Participated in the general organization, reviewed and selected PhD student scientific papers.

Lead Organizer

Generative AI Hackathon

| Arts et Métiers, Angers Campus | 2025

Designed and led a hackathon focused on using generative AI (prompt engineering) for 3D video game creation by engineering students.

Awards and Distinctions

- Winner, Laval Virtual Award | Laval Virtual | 2023
- Winner, IVRC Prize (International collegiate Virtual Reality Contest) | IVRC | 2023

Technical Skills

Programming & Web Development:

Python (Good knowledge), C#, TypeScript, MERN Stack (MongoDB, Express.js, React, Node.js).

AI:

LLM API Interaction & Integration (OpenAI GPT-4, Anthropic Claude, LLAMA, Gemini etc.), Prompt Design and Evaluation (Prompt Engineering), Use of AI Platforms (Hugging Face: models/libraries), Integration of AI Models (esp. real-time facial animation models), Generative Models (Text-to-Speech, Text-to-Image, Text-to-3D: principles and tools).

Graphics / Animation / XR / 3D:

AI-driven Facial Animation Techniques (NVIDIA Audio2Face, FOMM), 3D Printing (FDM/SLA Software, Modeling for printing), VR/XR Development (Fundamental principles, Unity/Unreal context), Image Generation Tools (e.g., Midjourney, FLUX, Stable Diffusion).

Data Analysis & Experimentation:

Design of HCI experiments in ecological settings (classrooms), Statistical Analysis (JASP: ANOVA, ANCOVA, t-tests, etc.), Qualitative Analysis (thematic coding principles).

Software & Tools:

Git, Zotero/Mendeley, Office Suite/equivalents, Basic video/audio editing tools.

Languages

- **French:** Native Speaker
- **English:** Good professional and scientific proficiency (reading, writing, speaking). Able to read scientific literature, write academic papers, and actively participate in academic discussions/presentations (Estimated CEFR Level: B2).