CULIÉ Jean-Benoit,
Postdoctoral researcher in Computer Science

✉ culie.jeanbenoit@gmail.com   in cjbenoit   ☎ +33 6 64 85 79 18

🌐 https://dev-jb.fr

My research focuses on Embodied Conversational Agents (ECAs), immersive environments for Virtual Reality (VR) training, Industry 4.0, and digital twins. Combining machine learning, biometric sensors, large language models (LLMs), and informed environments, my research aims to equip an educational CEA with emotions, empathy, and adaptability. The main objective is to enable this CEA to teach, in VR, how to operate and repair a digital twin, with or without LLM control, while strengthening learner engagement and motivation.
Video of thesis work: https://www.youtube.com/watch?v=0tJbn1AjgBg

Professional experience

Nov. 2025 – Today
Computer Science specialist [Operational reserve - National Gendarmerie, Melun, France]
Development of simulation tools for the Military Academy of the National Gendarmerie (AMGN). Activity carried out on a complementary basis.

March 2025 – March 2026
Post-Doctoral [Laboratory : Serious Game Research Lab (**SGRL**), Albi, France]
- Development of an immersive learning prototype integrating a large language model (LLM) to pilot the training of a digital twin in VR (Unity 3D).
- Participation in the supervision of two theses (Computer Science and Education Sciences).

2023 – 2024
Scientific collaboration [National Gendarmerie, Melun, France]
Technology transfer of the **CRITS** software to the Military Academy of the National Gendarmerie (AMGN).

2020 – 2021
Research Engineer - Unity 3D [Laboratory : Serious Game Research Lab (**SGRL**), Albi, France]
- (**4 months**) Multi-agent development of a generic virtual crowd for immersive training simulations (**CRITS**).
- (3 **months**) Development and modifications to the serious game **Clone**.
- (6 **months**) Development and modifications to the exergame **Play'n Ride** (2D et VR).

2018 – 2020
Unity 3D Developer (Work-Study Program) [**Vrai Studio**, Albi, France]
Development of the **RecyclageVR** application (PCVR and Standalone) which aims to raise user awareness about waste sorting.

Education

2022 – 2025
PhD in computer science [Paul Sabatier - Toulouse III, IRIT, France].
Thesis title : **Immserive Learning and Virtual Mentoring for Technical Training**.
Funding: Investment for the Future Program (PIA), Campus for Professions and Qualifications of Excellence (CMQE), **Industry of the future**.

2018 – 2020
Master's degree Computer science (with honors) [INU Champollion, Albi, France].
Master **AMINJ GAME** : *Audiovisual, Digital Interactive Media, Games, Gamification, Learning, Immersion, and Design Engineering.*

2016 – 2018
Master's degree Computer science (Career Change) [Paul Sabatier - Toulouse III, France].
Master **Data and Knowledge** : *Master's degree in Artificial Intelligence with a specialization in Big Data.*

2012 – 2016
Bachelor's Degree in Computer Science [INU Champollion, Albi, France].

Scientific publications

1 J.-B. Culié, D. Panzoli, and M. Galaup, "Pedagogical extension of the smart object concept for embodied conversational agents," *11th International Conference of the Immersive Learning Research Network*, pp. 272–279, 2025. 🔗 URL: https://hal.science/hal-05329649v1

2 J.-B. Culié, D. Panzoli, and M. Galaup, "Agents Conversationnels Incarnés et Engagement Émotionnel en Formation Immersive," *revue STICEF - Réalité étendue pour l'éducation et la formation*, 2025, Accepté : Publication au fil de l'eau en 2025. 🔗 URL: https://sticef.org/STICEF/announcement/view/4

3 J.-B. Culié, D. Panzoli, and M. Galaup, "Extension Pédagogique du Concept de Smart Object pour Les Agents Conversationnels Incarnés," in *Workshop Affects, Compagnons Artificiels et Interactions (WACAI)*, Bordeaux, France, Jun. 2024. 🔗 URL: https://hal.science/hal-04820722

4 J.-B. Culié et al., "A Crits Foray into Cultural Heritage: Background Characters for fhe SHELeadersVR Project," *CLIPE 2024-Creating Lively Interactive Populated Environments*, p. 6, 2024. 🔗 URL: https://hal.science/hal-05279593v1

5 J.-B. Culié, D. Panzoli, and M. Galaup, "Requirements for Efficient Virtual Mentorship," *Groupe de travail "Affects, Compagnons Artificiels et Interactions" (ACAI)*, Jul. 2023, Poster scientifique.

6 J.-B. Culié, S. Sanchez, and D. Panzoli, "Effortlessly Populating Immersive Training Simulations sith Background Characters," in *International Conference on Extended Reality*, Springer, 2023, pp. 172–183. 🔗 URL: https://hal.science/hal-04750549v1

Skills

Languages	🔖	Anglais (C1 – professional) : reading, writing, speaking
Development	🔖	C#, Python, Java, Web (Frontend / Backend), Relational Databases (MySQL, SQLite)
Simulation & Virtual Reality	🔖	Unity 3D, développement VR (PCVR et standalone – Meta Quest, HTC Vive, HP Reverb G2), simulation d'environnements techniques
Artificial Intelligence	🔖	Machine learning (TensorFlow, Scikit-Learn), large language models integrations (Hugging Face), Generative AI (ComfyUI, Ollama, LM Studio)
Immersive systems	🔖	Digital twins, immersive training environments, embodied conversational agents, autonomous agents
Technologies	🔖	Biometric sensors, Node.js, Flask, Arduino, Raspberry Pi, Android, Unity Netcode for GameObjects
R&D (Recherche et Développement)	🔖	Academic and applied research, technology transfer, scientific writing and popularization

Experiences

Teachings

2022 – 2025 🔖 **Data structure** : Supervision (36 hours/year) of Data Structure practicals (Java and Python) for students in the second year of the Bachelor's degree in Computer Science. (INU Champollion, Albi, France)

2022 – 2025 🔖 **Virtual reality (VR)** : Lectures and practicals (17h/year) in VR development (Unity 3D, C#, Meta SDK) for students in the Master's program **AMINJ GAME** and students at the **ISIS engineering school**.

Student supervision

2022 – 2024 🔖 **Master's Research Thesis** : Supervision of research theses for the AMINJ GAME master's degree.

- *The use of artificial intelligence to identify design flaws in video games.* (2022 − 2023)

- *Virtual tours: a Computer-Based Learning Environments for learning how to use multimedia equipment in higher education.* (2023 − 2024)

- *The contribution of VR to the acquisition of best practices in a high-risk environment.* (2023 − 2024)

Experiences (continued)

2024   **Tutored projects** : 2024 - (M1 et M2, 4 weeks) *Development of a serious game aimed at raising awareness of the challenges of global warming and its impacts. The project incorporates a neural network trained on NASA climate data to generate realistic weather predictions.*

2018 – 2025   **Trainees** : Supervision of interns and work-study students in computer science or 2D/3D modeling.

- January 2026 - INU Champollion Bachelor's Degree Intern in Computer Science (70 hours): *Implementation of Pedagogical Smart Objects in a digital twin in a VR environment, capable of transmitting their educational and contextual data to a large language model (LLM).*

- June 2025 - INU Champollion Bachelor's Degree Internship in Computer Science (126 hours) : *Development of a prototype serious game in virtual reality, in a chemistry laboratory, for learning how to mix fluids with different viscosities.*

- 2023 - Bachelor's degree intern (6 months) and work-study student (1 year 1/2) in Master's degree in 3D modeling : *Modeling, using Blender and Maya, of a digital twin, an immersive training environment, and virtual agents (full body character rigging, blendshapes), all adapted to the constraints of virtual reality.*

- 2021 - Third-year intern at the ISIS engineering school (8 weeks) : *Development of a virtual reality exergame on Unity 3D using the HTC Vive Cosmos VR headset, synchronizing a bike with the VR application using an Arduino microcontroller.*

Activities

2022 – 2025   **Science Outreach** : Participation in several science outreach events (European Researchers' Night, Omniscience, Explorer Meeting, …).

2018 – 2025   **Global Game Jam** : Participation in **Global Game Jam** events (48 hours to develop a game).