



Alexandre Gaston-Bellegarde

## Virtual Reality Developer & Neuropsychologist

One of my key strengths is my advanced knowledge of both neuroscience and IT development, which enables me to quickly understand researchers' and clients' needs and offer immediate software and technological solutions in line with their expectations.

### Professional Experiences

#### VR-PSY Platform Manager

Since 2018 Paris Cité University Paris

- Consultancy for national and European projects
- Development of customised virtual reality software solutions
- Teaching: production of innovative educational content and training to acquire cutting-edge skills for the virtual reality industry

#### Virtual Reality Engineer

Since 2018 Paris Cité University - MC<sup>2</sup> Lab Paris

- Software development for researchers' experimental and clinical studies: more than 20 softwares created, including 10 that have led or will lead to the validation of a scientific thesis
- Participation in the development of research projects
- Project management
- Trainee supervision
- Technological and scientific monitoring
- IT management and hardware maintenance
- Negotiations with suppliers and service providers
- Promotion of research projects into commercial products

#### Neuropsychologist

Since 2018 Freelance Paris

- Neuropsychological assessments for children and adults
- Cognitive training: use of innovative tools (virtual reality, serious games, metacognition, cardiac coherence, mindfulness...)

#### Neuropsychologist

From 2014 to 2018

Ophthalmology Department Adolphe de Rothschild Foundation Hospital Paris

- Neuropsychological diagnoses for children and adults
- Development of intervention strategies along with cognitive rehabilitation schemes and psychoeducative tools
- Creation of specific rehabilitation programs

### Education

#### Master's Degree in Psychology, specialized in Neuropsychology and Cognitive Psychology

From 2012 to 2014 Université Paris-Cité Paris

- Graduation project on the comparison between conventional tests, virtual reality and real-life tests on prospective memory in people affected by schizophrenia

#### Bachelor's Degree in Psychology

From 2009 to 2012 Université Paris Cité Paris

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### Assets

#### Teaching

- Course instructor and educational secretary for the "Virtual Reality and Fields in Psychology" university diploma
- Course instructor for bachelor's and master's degrees in research and neuropsychology

#### Efficient Project Management

- 5 years experience in managing and organising complex virtual reality projects

#### Advanced Technical Skills

- Mastery in technologies for the development of virtual reality softwares, in-depth knowledge of Unity 3D
- Scene Design // Pipeline (Standard /URP / HDRP) // Windows and Android Platforms
- Optimisation // Testing and debugging of virtual reality applications
- Good knowledge of C# // Use of APIs and frameworks
- Mastery in syncing Unity with physiological sensors (ECG, EDA, EEG, eye-tracking)
- Use of avatar modeling softwares (Character Creator 4, Quixel, Substance) // Modeling of 3D models
- Point cloud management // Photogrammetric element creation

### Languages

#### French

Mother tongue

#### English

Full professional competency

#### Pascale Piolino

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## Software Development

### Clinical Research

**Mathurin Game:** software development for cognitive rehabilitation (action planning and prospective memory) in patients affected by schizophrenia. A PHRC is currently underway to validate the protocol.

**REVALZ :** development of a tablet software measuring episodic memory for individuals with suspected Alzheimer's disease.

**FalseMem :** development of a virtual reality software solution to generate false memories.

**Embodiment :** development of a virtual reality software solution to fully immerse the subject (perception of body, arms, hands and feet) within a complex virtual environment (a city with multiple events that include interactions with various 3D characters of both positive and negative emotional valence). Each subject has a personalised avatar modeled from a picture.

**JePlaNif :** development of a software programme to evaluate prospective memory through the use of virtual reality, with the recording of navigation test results and physiological data.

**TOM :** development of a software solution assessing children's social cognition. The software displays short, immersive social scenes to test the different levels of social norm acquisition in children. It consists of evaluation and training components.

**Forensic Police :** conception of an immersive virtual reality module to prevent the stress generated by forensic autopsies. The aim is to reduce the traumatic risk associated with forensic officers' first autopsy.

**POEM-SET :** development of a software solution for the European project on soft skills in obstetric emergencies.

### Fundamental Research

**SpaceForce :** development of a virtual reality software solution to validate a mathematically construed theory on how affective processes govern human perceptions, decisions and behaviours in urban space.

**SNCF :** development of a virtual reality software solution to evaluate the dynamics of cognitive load (such as way finding) on information processing in the digital 3D twin of the SNCF Saint-Michel station.

**Cyberball :** development of a virtual reality adaptation of Cyberball. The latter is a soccer game used by researchers to assess reactions to social rejection.

#### Synchronisation between Unity and physiological sensors

Unity / BIOPAC (Physiology)/ Empatica E4 (Physiology)/ BrainProduct (EEG)/ SMI (eye tracking)/ Tobii (eye tracking in HTC Vive Pro Eye)

## Teaching and mentoring

- Instructor in the creation of a complete software solution and in the creation of a scientific project: **"Virtual Reality and Fields of Psychology"** university diploma
- Teaching of anamnesis in neuropsychology through the use of a novel method of active pedagogy: the simulation of anamnesis in virtual reality **"Professional Methods and Practices in Neuropsychology"**
- Teaching the value of virtual reality in clinical research **"Advanced Research Methodology"** for the Master's degree in Neuropsychology
- Teaching the development of software solutions and providing guidance to students during their graduation project: **"Virtual Reality and Cognition"** for the Master's in Cognitive Science
- Teaching of **"Scientific Mediation"** to Master's students: presentation of case studies to understand differences in ergonomics pertaining to specific populations

## Scientific Articles

-Drai-Zerbib, V., Bernigaud, L., **Gaston-Bellegarde, A.**, Boucheix, J. M., & Baccino, T. (2022). Eye Movements During Comprehension in Virtual Reality: The Influence of a Change in Point of View Between Auditory and Visual Information in the Activation of a Mental Model. Front. In book/conference Frontiers in Virtual Reality, section Technologies for VR.

-Abichou, K., La Corte, V., Sperduti, M., **Gaston-Bellegarde, A.**, Nicolas, S., & Piolino, P. (2021). The production of false recognition and the associated state of consciousness following encoding in a naturalistic context in aging. Consciousness and Cognition.

-Doulou, F, **Gaston-Bellegarde, A.**, Pascale Piolino, Nathalie Angeard (2021). Actes du colloque de la 13<sup>e</sup> édition du RIPSIDEVE 2020. Evaluation du développement de la Théorie de l'Esprit en Réalité Virtuelle (TdE-RV) chez l'enfant entre 3-4 et 5-6 ans.

-Msika, E. F., Ehrlé, N., **Gaston-Bellegarde, A.**, Orriols, E., Piolino, P., & Narme, P. (2022). Using a Computer-Based Virtual Environment to Assess Social Cognition in Aging: An Exploratory Study of the REALSoCog Task. Frontiers in Psychology.

Armougum, A., **Gaston-Bellegarde, A.**, Joie-La Marle, C., & Piolino, P. (2020). Physiological investigation of cognitive load in real-life train travelers during information processing. Applied Ergonomics.

Armougum, A., **Gaston-Bellegarde, A.**, Joie-La Marle, C., & Piolino, P. (2020). Expertise reversal effect: Cost of generating new schemas. Computers in Human Behavior.

Armougum, A., Orriols, E., **Gaston-Bellegarde, A.**, Joie-La Marle, C., & Piolino, P. (2019). Virtual reality: A new method to investigate cognitive load during navigation. Journal of Environmental Psychology.

Abichou, K., La Corte, V., Hubert, N., Orriols, E., **Gaston-Bellegarde, A.**, Nicolas, S., & Piolino, P. (2019). Young and older adults benefit from sleep, but not from active wakefulness for memory consolidation of what-where-when naturalistic events. Frontiers in aging neuroscience.