Curriculum Vitae

Arthur MANEUVRIER
Lecturer-Researcher in Cognitive Psychology

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Arthur Maneuvrier

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Website

General Overview

2025 - 2026 **Contractual Lecturer-Researcher**, University of Western Brittany, Lab-STICC.
2023 - 2025 **Post-doctoral Researcher, ANR DEEC project**, University of Western Brittany, CREAD.
2021 - 2023 **Temporary Teaching and Research Associate in Psychology**, Lab-STICC.

Associate Professor at the University of Quebec in Outaouais, Cyberpsychology Laboratory.
Associate Researcher at the Forensic Immersion Lab of the Institut de Psychiatrie Légale Philippe-Pinel de Montréal.
Associate Researcher at the Interdisciplinary Research and Innovation Centre in Cybersecurity and Society.

PhD in Cognitive Psychology in international co-supervision (Universities of Caen and Montreal, 2020):

The sense of presence in virtual reality: moderating role of human factors on performance.

Teaching activities (677.5 HETD)

Bachelor's	**Master's**
Methodology & Statistics [369 HETD]	Virtual reality & cognitive sciences [58 HETD]
Cognitive Psychology [110 HETD]	Research supervision [36 HETD]
Other fundamentals [84 HETD]	Methodology & Statistics [20.5 HETD]

Research Themes

- **Virtual Reality**: psychophysiology in immersion, sense of presence and embodiment, cybersickness, human factors, performance, gender/sex effects, cybersecurity, simulation, phenomenology...
- **Cognition and Perception**: multisensory integration, sensory conflicts, cognitive styles, 4E cognition ("embodied, embedded, enacted, expanded"), affordances, internal models, sensorimotor loops...
- **Neuropsychology**: executive functions, spatial cognition, learning, ecological assessments, remediation, cognitive and behavioural therapies and remediations, pain assessment and reduction...
- **Human-System Interaction**: representational vs. embodied cognition, modelling, human-computer interfaces, artificial agents, automation, cyberpsychology, philosophies of mind, adaptive systems, ergonomics...
- **Experimental Methodology**: experimental bias, replication crisis, open science, controlled trials, non-linear analyses, multi-dimensional analyses, machine learning, psychometrics...

Key Highlights

- Recipient of the international **thesis prize** from ACFAS and the Consulate of France in Quebec (2021).
- Publication of **6 scientific articles** as first author in international journals, including 5 in Q1.
- Member of an international committee (CYPSY27) and completion of **25 Q1 peer reviews** of VR studies.
- Implementation and analysis of 7 experiments, including **5 in VR** and **2 large-scale ANR** studies (N = 4000).
- **10 years of experience with Unity3D** and C# for VR, 6 environments and 3 software deposited under open licence.
- VR consultant on numerous projects, **supervision of 8 master's students**, support for doctoral supervision.
- **Ranked 2nd** (CPJ Rennes 2), **4th** and **5th** (MCF, Paris 13) in previous applications in 2025.

Education

2022 **Qualification as Senior Lecturer**, *Section 16*.

2017–2020 **PhD in Psychology**, *specialised in Cognitive & Computational Neurosciences*, international co-supervision between the University of Caen-Normandy and the University of Montreal, awarded the Exceptional Distinction (highest distinction at the University of Montreal), co-supervision: Patrice Renaud (UdM, Cyberpsychology Laboratory), Philippe Fleury (Unicaen, Interdisciplinary Virtual Reality Centre), supervision: Leslie Decker (Unicaen, Inserm U1075).

- Psy-6008: Qualitative analyses.
- Psy-6127: Cognitive-behavioural therapy.
- Psy-6303: Contemporary theories in psychology.
- Psy-6855: Professional placement.
- Psy-6976: Experimental techniques in cognition.
- Psy-7005: Designing and communicating research.
- Psy-7006: Doctoral project seminar (neuroscience and neuropsychology).
- Thesis: "The sense of presence in VR: moderating role of human factors on performance".

2015–2017 **Master's in Neurosciences and Behavioural Sciences**, *Speciality: Behavioural Sciences*, University of Caen Normandy, with Distinction, Research placement at the Interdisciplinary Virtual Reality Centre and at Comete INSERM U-1075, supervised by Leslie Decker and Stéphane Besnard..

- Year 1: "Sense of presence, motion sickness and perceptual styles in virtual reality".
- Year 2: "The sense of presence in virtual reality studied through behavioural sciences".

2012–2015 **Bachelor's in Psychology**, University of Caen Normandy, with Distinction.

- Undergraduate Research Project: "The door-in-the-face technique interpreted as a reduction of cognitive dissonance."

Experience

2025-2026 **Contractual Lecturer-Researcher**, *University of Western Brittany*, Department of Psychology, Lab-STICC UMR-6285 Laboratory, Brest.

- Course coordinator for Experimental Research Methods (Year 3).
- Course coordinator for Cognitive Psychology (Year 3), language module.
- Course coordinator for Experimental Methodology (Year 2).
- Teaching contributions in the CAER Master's programme ("Current Issues" M1, "Data Analysis" M2).
- Teaching contributions in Year 1 (General Psychology) and Year 3 ("Psychometric Statistics").
- Analysis, publication and dissemination within the ANR DEEC[1] project (ministerial dissemination, seminars).
- Participation in the development of the ANR Cotarix[2] research project.
- Analysis, writing and publication of the ChronoVR[3] study.
- Reviewing for Virtual Reality (x2), Computers in Human Behavior (x2), The Visual Computer, Frontiers in Aging Neuroscience, Scientific Reports.

[1]DEEC: Détermination d'Efficacité des Expérimentations Contrôlées (Determining the Effectiveness of Controlled Experiments) is an ANR-funded study (2022–2026) evaluating a pedagogical sequence through two large-scale experiments (4000 pupils, 200 schools, 3 academies and 5 departments).

[2]Cotarix: COasT At RIsks with eXtended reality is an ANR research project currently under submission (phase 2), aimed notably at studying the effect of embodiment in virtual reality to foster understanding of natural coastal risks.

[3]ChronoVR: CHRONOception in Virtual Reality is an experimental study (N = 100) conducted with 8 students from the CAER Master's programme (2023), investigating various human factors in VR with respect to the perception of time in immersion.

2023-2025 **Post-doctoral Researcher on the DEEC Project**, *University of Western Brittany*, INSPE de Bretagne, CREAD EA-3875 Laboratory, Rennes.

- Logistics and coordination of the institutional DEEC project (ANR, scheduling, consortium...).
- Implementation of the Data Management Plan and Open Science recommendations.
- Methodological and statistical design, stratified pseudo-randomised sampling.
- Creation of experimental and assessment materials in accordance with international standards.
- Development of a collaborative working framework (Peertube, Moodle, Wordpress, Celluloid...).
- Data collection, cleaning, analysis, storage and Open Science archiving.
- Coordination and synergy among researchers, technicians and doctoral students.
- Participation in conferences, edited volumes, workshops and seminars on study methodology.
- Course coordinator for Psychometric Statistics (Year 3) and Quantitative Methods (M1 and M2).
- Analysis, writing and publication (2 articles) of the ChronoVR study.
- Participation in doctoral supervision of several students.
- Reviewing for Nature Communications, Virtual Reality (x3), Frontiers in Virtual Reality, Plos One, Computers in Human Behavior, Frontiers in Psychology, IEEE VR, CYBPSY27.

2021–2023 **Temporary Teaching and Research Associate**, *University of Western Brittany*, Department of Psychology, Lab-STICC UMR-6285 Laboratory, Brest.

- Direction, development, coordination and implementation of the ChronoVR study.
- Research supervisor for 8 students in the CAER Cognitive Psychology Master's programme.
- Teaching contributions in the CAER Master's programme ("Current Topics", "Research Support").
- Course coordinator for Experimental Research Methods (Year 3).
- Course coordinator for Experimental Methodology (Year 1).
- Teaching contributions in Cognitive, Developmental (Year 1), Experimental Methodology (Year 2).
- Writing and publication of a theoretical article in the MIT's specialist VR journal.
- Development and dissemination of a Virtual Rod and Frame Test, the VRFT[1].
- Coordination of the Pièces Jaunes Starwalker[2] project with the Caen Hospital.
- Remote teaching, assessments (Moodle) and scientific outreach (conference) during COVID.
- Analysis and publication of two articles from doctoral thesis experiments.
- Reviewing for Virtual Reality, Frontiers in Virtual Reality, Plos One.

2017–2020 **Doctoral Researcher with Teaching Duties**, *University of Caen-Normandy and University of Montreal*, Interdisciplinary Virtual Reality Centre, Institut Philippe-Pinel de Montréal, Cyberpsychology Laboratory, Comete INSERM U-1075, PhD in Psychology, speciality cognitive and computational neurosciences.

- Theoretical and logistical development of the doctoral project with the various partners.
- Conceptualisation, development and implementation of 3 VR experiments.
- Courses, placements and seminars required to obtain the General Doctoral Examination (UdeM).
- Integration into laboratory life (conferences, seminars, exchanges between doctoral students).
- Creation and implementation of the Pièces Jaunes Starwalker[2] clinical project with Caen Hospital.
- Participation in the maintenance of two research infrastructures (VR rooms).
- Design of the "Introduction to VR Techniques" workshop for STAPS Master's Year 1 students.
- Two lectures on VR in psychology within the STAPS APAS Master's Year 2 programme.
- Lecture series on VR within the Digital Culture component of the Digital Humanities programme.
- Supplementary teaching contract with lectures in psychology (Social Psychology, Year 1).
- VR consultant for several research projects (notably the ReveCot[3] project).
- Conceptualisation and development of the PhiVR[4] pilot software.

[1]VRFT: Virtual Rod and Frame Test (2022). This open-source VR software is used by around ten researchers. It is an immersive and modular update of the tool developed by Witkin and colleagues.

[2]Starwalker: is both the name of the research and clinical project (2018–2020) and the name of a VR mini-game software playable with the lower limbs, designed for the rehabilitation of kinaesiophobic children, and still in use at Caen University Hospital.

[3]ReveCot: REalité VirtuellE et villes COTières (Virtual Reality and Coastal Cities) is an interdisciplinary project (2018–2021) aimed at evaluating the effectiveness of VR submersion simulation for raising awareness among elected officials and administrators of natural flood risks.

[4]PhiVR: PHI Angle Virtual Reality estimation is a research project (2020) and software tool designed for VR users to measure i) the immersive capabilities of a VR system, ii) the perceptual and cognitive profile of a user, and iii) the interaction between the two in order to estimate the quality of the immersive experience.

Teaching Activities

Course	Level	Discipline	University	Year	Lec.	Tut.
Psychology Fundamentals					**12**	**176**
Cognitive Psychology*	Yr 3	Psychology	UBO	2021/2026*	12	58
Developmental Psychology	Yr 1	Psychology	UBO	2021	–	48
Social Psychology	Yr 1	Psychology	Caen	2018	–	36
Cognitive Psychology	Yr 1	Psychology	UBO	2021	–	22
General Psychology	Yr 1	Psychology	UBO	2025	–	18
Methodology & Statistics					**56**	**298**
Experimental Methodology*	Yr 2	Psychology	UBO	2021/2022/2026*	12	86
Experimental Methodology*	Yr 1	Psychology	UBO	2021/2022*	32	46
Statistics*	Yr 3	Psychology	UBO	2025*/2026*	12	81
Experimental Research Methods*	Yr 3	Psychology	UBO	2022*/2025*	–	72
Quantitative Methods*	M2	Educ. Science	UBO	2023*/2024*	–	12
Quantitative Methods*	M1	Educ. Science	UBO	2023*/2024*	–	4
Cognitive Psychology & Virtual Reality					**31**	**16**
VR Assessment Methods*	M1	STAPS	Caen	2019*/2020*	–	16
Current Issues*	M1	Psychology	UBO	2026*	8	–
Current Topics*	M1	Psychology	UBO	2021/2022*	8	–
New Technologies & Health	M2	STAPS	Caen	2019/2020	6	–
Digital Culture	B-M-D	Digit. Hum.	Caen	2017/2019/2021	6	–
Assessment Methods	M2	Psychology	UBO	2026	3	–
Supervision					**24**	**–**
Supervised Research Project*	M1	Psychology	UBO	2022*	22	–
Professional Development	M2	Psychology	UBO	2022	2	–
Total Tutorial-Equivalent Hours (HETD)						**674.5**

**Course coordinator or co-coordinator (assessment management, coordination of teaching assistants...).*

Psychology Fundamentals – 194 HETD

1. **Cognitive Psychology: perception and comprehension of language (Yr 3 - UBO - 12h Lec., 58h)***
   I first taught the tutorial sessions for this course with Nathalie Le Bigot in 2021, before taking full responsibility in 2026, delivering both lectures and tutorials and coordinating a colleague's tutorial sessions. This is a foundational course on the perception and comprehension of spoken and written language: its development, anatomical and functional properties, and its main theoretical frameworks. The course explores in greater detail the interactions between bottom-up and top-down processes, as well as the role of multisensory integration and more broadly of perception in cognition. Psychophysics is extensively covered, from the categorical discrimination of phonemes through to cortical processing. The tutorials are supported by numerous experiments that alter sensory modalities and contextual cues, in order to demonstrate their mutual influence by collecting, processing and interpreting data from the tutorial group. Building on a pre-existing course and adapting it, I created an additional experimental tutorial on perceptual restoration, in which students must construct the experimental material by combining Audacity, Text-to-Speech software and a Python script for randomised counterbalancing. I also added a lecture presenting a 4E cognition approach to language, its contributions and limitations with respect to the classical representational view, enriched by reflections on generative artificial intelligence based on large language models, in order to compare their functioning with that of human language.

2. **Developmental Psychology: introduction (Yr 1 - UBO - 48h Tut.)**
   Introduction tutorial sessions for the discipline of developmental psychology (course coordinator: Amandine Dubois). The aim was to illustrate the classical and emerging theoretical concepts and currents in the discipline, taking psychomotor development in children as an example through a cross-cultural approach studying and interpreting individual developmental differences.

3. **Social Psychology: introduction (Yr 1 - Caen - 36h Tut.)**
   Introduction tutorial sessions in social psychology (course coordinator: Jessica Mange). These sessions primarily involved replicating social psychology studies to discover the fundamental themes of the discipline: internal/external attribution, inter/intra-group dynamics, conformity and normalisation, submission to authority. This course had a strong experimental dimension, which reinforced my belief in the pedagogical value of experimental work in psychology tutorials.

4. **Cognitive Psychology: perception and attention (Yr 1 - UBO - 22h Tut.)**
   Tutorial sessions on visual perception (course coordinator: Nathalie Le Bigot). Starting from the Müller-Lyer illusion and conducting experiments within the tutorial whose collected data served as a basis for studying the illusion, this course was designed to show the constructed nature of perception, its links with attention, and the interactions between bottom-up and top-down processes, as well as the methodology of cognitive psychology, which brings together phenomenology and experimental psychology. This last aspect seemed particularly interesting to me because I was simultaneously teaching experimental methodology, which allowed for a fruitful illustration of the mutual contributions between research and methodology.

5. **General Psychology: introduction to psychology (Yr 1 - UBO - 18h Tut.)**
   Introduction tutorial sessions in general psychology (course coordinator: Anaïs Raison). These sessions primarily involved discovering and/or reproducing foundational studies in experimental psychology, such as learning curves (recency and primacy effects) or the various taxonomies of memory (sensory memory, working memory, etc.).

Methodology and Statistics – 385 HETD

1. **Experimental Methodology (Yr 2 - UBO - 12h Lec., 86h Tut.)***
   After teaching the tutorials in 2021 and 2022 under Nathalie Le Bigot's supervision, I took full responsibility for the course in 2026 (lectures and tutorials, coordinating contributions from a colleague ATER and a doctoral student). This course deepens the experimental methodology taught in Year 1. Through theoretical presentations in lectures, exercises and hypothetical experimental scenarios in tutorials, followed by real scientific articles, the objective was to teach the principles of experimental methodology: theoretical and operational hypotheses, types of variables (dependent, independent, random, extraneous), types of samples and sampling methods, types of measures and experimental designs, reflection on experimental biases and their neutralisation (counterbalancing, presentation order, randomisation...), ethical considerations and data protection. Students were assessed notably on their ability to extract a complete experimental design from a real scientific article written in French.

2. **Experimental Methodology (Yr 1 - UBO - 32h Lec., 46h Tut.)***
After teaching the tutorials in 2021, I took full responsibility for the course in 2022 (lectures and tutorials, coordinating contributions from two part-time instructors). Inspired by a pre-existing curriculum focused on the introduction to experimental methodology (hypotheses, samples, variables, experimental design, standardisation and experimental bias), I added a more general introduction to epistemology and the history of experimental sciences, including discussions of positivism and post-positivism. Using running examples from experimental paradigms, I presented the fundamentals of experimentation step by step and explained how methodological rigour enables the acquisition and evaluation of knowledge. I concluded with a critical perspective on experimentation (the replicability crisis, ethics and data protection).

3. **Psychometric Statistics (Yr 3 - UBO - 12h Lec., 78h Tut.)***
Lectures and tutorials under my responsibility (2025), then co-coordination replacing Hervé Guyon (2026). This course, comprising 6 hours of lectures and 10 hours of tutorials per group, aimed to teach the statistical and psychometric validation of measurement tools in psychology, as well as ANCOVA. After some theoretical considerations on the notion of "measurement" in psychology and the question of constructs, the course addressed reliability analyses and confirmatory factor analyses using the JASP software. The assessment consisted of a practical statistical analysis portfolio, allowing continuous support throughout the semester using individualised simulated data in order to teach best practices in psychometric validation. The tutorial exercises were first performed on simulated data, then on real data from psychological measures, in order to illustrate textbook cases and particular instances of construct validation.

4. **Experimental Research Methods (Yr 3 - UBO - 72h Tut.)***
Course (tutorials only) for which I was the sole instructor and coordinator. Students had to, in small groups and with progressive support throughout the semester, conduct a psychology experiment on a topic of their choosing. Assessment consisted of a written presentation of their study (2026) or an oral presentation (2022). The richness of this teaching lay in its development in partnership with Hervé Guyon, the lecturer responsible for the statistics course. Indeed, the data collected or simulated experimentally based on the experimental design were subsequently analysed within the statistics course (following semester). This allowed students to work on their own data from their own projects, illustrating the inseparable link between research methodology and statistical analyses, while stimulating their interest through the study of psychological phenomena of their own choosing. This course received numerous positive responses from both students and teaching staff.

5. **Quantitative Methods (M2 - INSPE Bretagne UBO - 12h Tut.)***
Advanced course for students in the M2 RED (Research, Teaching, Didactics) programme. Delivered over two consecutive years across two half-days, this course was designed entirely by me. The first sessions covered the epistemological and methodological principles of quantitative analyses, the main tenets of experimental methodology, access to public data (DEPP), individual data protection (GDPR), open science (FAIR) and the limitations of quantitative analyses. I then implemented a workshop comprising various exercises (databases, problem statements and step-by-step tutorials) to teach the use of the JASP software on exercises typical of educational sciences. The final sessions took the form of workshops and/or support for applied quantitative analyses related to research themes (research dissertations) using JASP.

6. **Quantitative Methods (M1 - INSPE Bretagne UBO - 4h Tut.)***
Introductory course in quantitative analyses in educational sciences for the Master's RED (Research, Teaching, Didactics) programme, designed entirely by me. The first sessions covered the epistemological and methodological principles of quantitative analyses, the main tenets of experimental methodology, access to public data (DEPP), individual data protection (GDPR), open science (FAIR) and the limitations of quantitative analyses. The final sessions focused more specifically on the functioning of statistical tests, descriptive and inferential statistics, notably through examples from educational sciences (multilevel models, intraclass correlation coefficient, etc.).

Cognitive Psychology and Virtual Reality – 59.5 HETD

1. **VR Assessment Methods (M1 - Caen - 16h Tut.)***
Practical workshops of eight hours each delivered in the immersive room at CIREVE, designed and implemented by me, focusing on the use of virtual reality (VR) for the assessment of human behaviour. During these workshops, students alternated between the roles of experimenter and participant in four mini-studies in VR, based on the virtual environments developed for my doctoral thesis. They thus conducted a Virtual Rod and Frame Test, a Virtual

Wisconsin Card Sorting Test, a virtual assessment of spatial cognition, and a treadmill walk with full motion capture. The aim was to introduce students to VR methodology and technologies, addressing key concepts such as the sense of presence and cybersickness. Assessment consisted of a portfolio on one of the two forms of evaluation (executive functions, spatial cognition, motor skills, perceptual style), presenting for each the specific contributions of virtual reality.

2. **Current Issues (M1 - UBO - 8h Lec.)***
   Eight hours of lectures entirely designed for this course unit shared between the CAER (cognition) and RESPI (social sciences) Master's programmes, on the theme of "Memory". I chose "the memory trace" as a guiding thread, beginning with an epistemological history of the notion, presenting less well-known conceptions in particular (Greek philosophy, phenomenology, Husserl, Merleau-Ponty). This approach allowed me to develop two visions of memory illustrated by Cartesian and then scientific approaches: the "embodied" approach, for which a memory trace is "a reactivated bodily state", and the "symbolic" approach, in which the memory trace is information biologically encoded in symbolic form. Through empirical data, reflection exercises and theoretical models, I used this guiding thread to illustrate the major philosophies of mind (computationalism, connectionism, functionalism), as well as embodied cognition and 4E cognition, in order to bring these complementary approaches into dialogue on a central question: that of the human mind. I also proposed exploratory methodological directions, notably by drawing on VR.

3. **Current Topics (M1 - UBO - 8h Lec.)***
   Four hours of lectures entitled "Virtual Reality and the Future of Psychology", as part of the core curriculum of the Psychology Master's programme ("Current Topics") for the Cognitive Psychology speciality (CAER Master's). The first part proposed to study the methodology and contributions of VR in psychology, with an emphasis on neuropsychological assessment, remediation, cognitive-behavioural therapies (CBT) and the human factors inherent in the tool for methodologically rigorous use (cybersickness, sense of presence, gender/sex). The second part invited exploration of the future of psychology through three main themes: virtual and augmented reality, artificial intelligence and big data, and telecommunications and robotics. The aim was to use current authors, theories and applications to present these three concepts and their articulations within cognitive and behavioural sciences. The final part considered these technologies from the angle of their contributions and limitations (ethical and environmental). This course, which generated lively discussion, concluded with a Q&A session with students.

4. **New Technologies & e-Health (M2 - Caen - 6h Lec.)***
   Lectures entitled "Virtual Reality and Neurosciences" within the APAS Master's Year 2. In this context, I presented the general functioning and contributions of virtual reality before focusing on its use in diagnostics, assessments, and exposure therapies or cognitive remediation. I detailed the example of Starwalker, a VR video game project designed for the care of kinaesiophobic children, developed in partnership with the Pain Assessment and Treatment Centre at Caen University Hospital. I also presented my doctoral research and the fundamental necessity of considering human factors (cybersickness, sense of presence, gender/sex...) when using VR to ensure a methodologically robust application of the tool. I concluded by broadening the discussion to the relationships between virtual reality and other new technologies, notably telecommunications, big data and artificial intelligence.

5. **Digital Culture Lectures (B-M-D - Caen - 6h Lec.)**
   Lectures within the Digital Humanities curriculum. These contributions focused on VR, its processes, contributions and limitations, notably within cognitive neurosciences. During this presentation I outlined the main applications of the tool and ongoing developments within cognitive and behavioural disciplines, before drawing on my own research work as examples (spatial cognition, neuropsychological assessment, Starwalker project...). I then presented applications from the humanities (journalism, awareness-raising, arts...) before questioning the limitations of the tool (data protection, environmental impact).

6. **Assessment Methods (M2 - UBO - 3h Lec.)***
   Three hours of lectures with second-year CAER Master's students on assessment methods, focusing on psychophysiological data collected in virtual reality. After a brief introduction to the contributions and current applications of VR, this lecture presented various examples and uses of physiological, psychological and behavioural data collection in VR, and their combination. It discussed the possible biases and variables to control for a rigorous use of the tool, as well as the difficulty of disentangling different dimensions (for example: measures of cybersickness and anxiety during exposure-based CBT, as both phenomena share many psychophysiological symptoms). This lecture concluded with a brief presentation of the main statistical tools in psychometric validation (CFA) and signal analysis, with an emphasis on non-linear analyses (autocorrelation analyses for time series) for the study of dynamic systems.

Master's and Doctoral Supervision – 37.5 HETD

1. **Supervised Research Project (M1 - UBO - 24h Lec.)***
   Supervision under my responsibility of 8 students from the CAER Master's programme (Cognition, Learning, Assessment and Remediation: VR and Simulation track). In September, after a brief introduction, I proposed eight different themes related to my research topics, which students chose and adapted according to their preferences. These eight topics were structured around a common experiment planned for spring (ChronoVR), with each student focusing on one aspect and one or two experimental measures. Throughout the year, I alternated between individual meetings, allowing progress on theoretical and experimental research to be assessed, and group workshops to discuss the overall experiment, conduct preliminary analyses and test the virtual environment. In parallel, I delivered presentations and workshops for all CAER Master's students to guide their research, covering everything from the methodology required for a literature review (Zotero, bibliographic searching...) and the broader epistemological framework, to ethics and data protection (GDPR, ethics committees), reporting of methods and results (APA standards, scientific article format) and the experimental approach (controlled trials, null hypothesis testing...) as well as the main statistical tools (psychometrics, linear analyses, analyses of variance...). I subsequently coordinated the recruitment and running of the experiments and supported students in the analysis of their results. Finally, I served as a rapporteur for the dissertations of the 8 CAER students I was not directly supervising. This research led to two publications and an article in progress with two of the Master's students.

2. **Professional Development (Department of Psychology - M2 - UBO - 2h Lec.)**
   Contribution to the UBO Psychology Master's core curriculum to briefly present my academic career path to students and answer their questions about the research world, as well as to support them in their personal project steps, particularly applications for doctoral projects.

3. **List of research supervisions (master's)**
   Alan Grysole: Sense of presence and flow in virtual reality.
   Laurent Lansonneur: Impact of video games on psychophysiological adaptation in virtual reality.
   Luca Mourgaud: Flow and performance in virtual reality.
   Lou-Anna Le Guen: Alteration of time duration in virtual reality.
   Magali Hamard: Study of the links between field dependence and flow state in virtual reality.
   Trang Nguyen: Effect of head movement-related cybersickness on visuomotor performance in VR.
   Nawel Schappacher: Gender and/or sex differences in virtual reality.
   Tristan Feutren: Virtual reality: an effective tool for studying time perception?

4. **List of doctoral supervision support**
   Tristan Feutren (École de l'Air et de l'Espace): consultation on video game practice and flow in VR.
   Sara Coté (ETS Montréal): consultation on the sense of presence in virtual reality.
   Maëlis Lefebvre (ISAE - SUPAERO): consultation on the Rod and Frame Test.
   Philippe Villeneuve (University of Paris Nanterre): consultation on the Rod and Frame Test.
   Paul Crépin (UBO): consultation on the Rod and Frame Test.
   Clémence Lelaumier (University of Caen): consultation on the sense of presence in virtual reality.
   Mathieu Brideau-Duquette (University of Montreal): consultation on the sense of presence in virtual reality.
   Journal Catherine (Université Côte d'Azur): consultation on statistical methodology.

Research Activities

Virtual reality is today deployed in contexts where the quality of the immersive experience conditions the validity of what one seeks to measure or produce: neuropsychological assessment, cognitive remediation, simulation-based training, exposure therapy. Yet a fundamental paradox runs through this entire field. The more immersive a virtual environment is, the more it engages the user's cognitive, perceptual and motor processes, and the greater the risk of contaminating the data it is supposed to produce. A protocol for assessing executive functions in virtual reality does not only measure the patient's planning or inhibition: it also measures the way that patient inhabits an artificial environment, adapts to sensory conflict, genuinely feels "inside" it and embodies an avatar. Ignoring this layer of influence is to introduce into the measurement a systematic bias whose magnitude is neither estimated nor controlled. My work starts from this paradox and addresses it along three complementary axes.

The first axis of my research focuses on understanding, modelling and controlling the influence of virtual reality on psychophysiology and performance: this work has led to the Phi Angle model, published in the journal PRESENCE (MIT Press), which formalises the interaction between the user's cognitive-perceptual profile and the properties of the immersive system to predict the quality of the virtual experience and, *in fine*, performance on the assessed task, which gave rise to an eponymous software tool. Among the identified factors, visual field dependence, measured by the Virtual Rod and Frame Test I developed, predicts up to 25% of the variance in cybersickness, even before immersion. Unsupervised clustering analyses of head rotation patterns as well as post-immersion subjective questionnaires allow users to be classified according to their adaptation profile, opening the way to dynamic detection. This work is embedded in a methodological stance attentive to the replication crisis: I have documented the moderating effect of the experimenter's gender/sex on measures of cybersickness and video game practice, and during my postdoctorate I was the principal contributor to the DEEC experiments, a large-scale ANR study ($N = 4000$), which allowed me to develop strong competencies in experimental design, open data management and psychometrics.

The second axis puts this rigour at the service of applications of virtual reality in psychology, combining ecological validity with experimental control: control of human factors, feasibility and empirical comparisons of immersive versus paper-and-pencil tools, psychometric validation. The environments I have developed — Neuropresence, HanoiVR, Edupresence, Spatiopresence and SpaceShooter — serve as applied settings for assessing executive functions, learning, spatial cognition and time perception respectively. On the clinical side, the Starwalker project, a mini-game platform for the remediation and rehabilitation of kinaesiophobic children developed in partnership with Caen University Hospital, illustrates the therapeutic added value of virtual reality when grounded in an understanding of the embodiment and flow mechanisms it mobilises. These therapeutic applications, extended by my collaborations with the Cyberpsychology Laboratory of the University of Quebec in Outaouais and the Philippe-Pinel Institute in Montreal on exposure therapies and remediation in virtual reality, raise precise theoretical and methodological questions: what level of presence and embodiment is necessary for the exposure to be clinically active, and how can the symptoms of therapeutically necessary anxiety be distinguished from those of cybersickness, which share the same phenomenology?

The third axis of my research reverses the immersive paradox as a theoretical lever for the study of cognition itself: if virtual reality so profoundly modifies the cognitive processes of those who inhabit it, it constitutes an experimental instrument without equivalent for questioning the foundations of cognition and empirically confronting embodied approaches with representational ones. By allowing controlled manipulation of avatar morphology, environmental affordances, or the properties of the sensorimotor coupling, virtual reality generates opposing empirical predictions depending on whether cognition is anchored in the perceived body or in abstract representations indifferent to the bodily envelope. These reflections constitute a recurring thread in my studies, notably when examining why the sense of presence promotes spatial cognition performance in a virtual environment, accounting for up to 20% of the measured performance (article in Frontiers in

Virtual Reality). These questions take on new resonance with the rise of artificial agents based on large language models: the cohabitation in an immersive space of a user embodying an avatar and an intelligent artificial agent generates novel experimental situations for studying the psychophysiological conditions of the attribution of intentionality and social presence. This inquiry extends a central question of contemporary cognitive science and also carries a digital security dimension directly linked to my collaboration within the Interdisciplinary Research and Innovation Centre in Cybersecurity and Society, which investigates these issues.

This research programme as a whole rests on technical mastery and rich university collaborations: ten years of developing virtual environments under Unity3D and C#, six virtual environments and three software tools deposited under open licence, maintenance of CAVEs in two different laboratories, expertise in unsupervised machine learning applied to behavioural data, and advanced practice in psychometric and non-linear analyses. It is also embedded in a coherent open science stance (FAIR principles, pre-registration, sharing of code and data) and in an active network of international collaborations in Quebec and Europe, through numerous scientific and technical consultations and recommendations, notably around the VRFT, as well as sustained editorial activity for leading journals in the field: Frontiers in Virtual Reality, Computers in Human Behavior, Virtual Reality, Plos One, IEEE VR...

Doctoral Thesis

Title	*The sense of presence in VR: moderating role of human factors on performance*
Co-supervision	Patrice RENAUD (University of Montreal, Cyberpsychology Laboratory) & Philippe FLEURY (University of Caen, Interdisciplinary Virtual Reality Centre)
Supervisor	Leslie DECKER (University of Caen Normandy, Comete Inserm U-1075)
Jury	Emilie LOUP-ESCANDE (University of Picardie), Sylvie BELLEVILLE (University of Montreal), Franco LEPORE (University of Montreal), Jean-Louis VERCHER (University Aix-Marseille), Daniel MESTRE (University Aix-Marseille)
Date	Defended on 20 December 2020, with the Exceptional Distinction from the University of Montreal

This thesis is situated in both a fundamental and methodological framework, aiming to build a rigorous body of knowledge on virtual reality and the sense of presence. Its central question is the following: if presence promotes performance on a cognitive or neuropsychological test, it becomes a systematic bias inherent to the tool that must be controlled for in any rigorous experiment. Three experiments focusing respectively on executive functions, spatial cognition and semantic learning are presented. Using comparative factor analyses, the results distinguish two components of the virtual reality experience: the user's cognitive-perceptual profile, constituted by individual human factors interacting with the properties of the immersive system, which in turn modulates the user experience upon which the sense of presence, performance and their relationship depend. This Phi Angle model, presented in conclusion, is discussed in light of enactivist and rationalist approaches to cognition, and gives rise to recommendations for users of virtual reality as well as a software prototype (PhiVR) enabling the *a priori* estimation of an individual's immersive experience quality. This doctoral work has been downloaded more than 4300 times since its deposit on HAL in April 2021.

Published Articles as Principal Investigator

*2024 **Experimenter bias: exploring the interaction between participant's and investigator's gender/sex in VR**, *Arthur MANEUVRIER (University of Western Brittany)*, Virtual Reality – https://doi.org/10.1007/s10055-024-00993-2.
[Scimago Q1; 3368 direct accesses; Google Scholar 9 citations]

This article explores the experimenter effect, considered one of the causes of the replication crisis. After a review of the state of replicability in psychology and a discussion of the use of the term "gender/sex", this study compares data from the experiment conducted at UBO with CAER Master's students according to the gender/sex of the experimenter and the gender/sex of the participant. Indeed, half of the students were male and the other half female, and all conducted a roughly similar number of experiments, allowing a reasoned comparison during the experimental sessions. Using traditional inferential statistics (MANOVA – ANOVA – Post-hoc), the results show that men and women differ in their cybersickness and video game practice scores when assessed by male experimenters, but display similar levels when assessed by female experimenters. These data are discussed in light of psychosocial stress theory and conformity to gender stereotypes potentially induced by the masculine connotations of virtual reality and video games. The article concludes with a methodological discussion on the value of including a description of the experimenter in experimental articles.

*2023 **Predicting VR cybersickness and its impact on visuomotor performance using head rotations and field (in)dependence**, *Arthur MANEUVRIER (University of Western Brittany, University of Quebec in Outaouais), Trang NGUYEN (University of Western Brittany), Patrice RENAUD (University of Quebec in Outaouais)*, Frontiers in Virtual Reality – https://doi.org/10.3389/frvir.2023.1307925.
[Scimago Q1; 3372 direct accesses; Google Scholar 21 citations]

This exploratory study, in collaboration with Trang Nguyen, a CAER Master's student supervised as part of the research supervision programme, originates from a theme already addressed in a previous study with Patrice Renaud (University of Quebec in Outaouais), which explored the links between head rotation/movement patterns and cybersickness symptoms in virtual reality. By adding measures from the Rod and Frame Test (the "VRFT" environment) whose processes associated with virtual reality had been revealed by my two previous articles, the aim of this study was to attempt to predict the occurrence of negative symptoms i) prior to immersion and ii) automatically during immersion, and to estimate their impact on visuomotor performance. Results show that the field dependence score predicts up to 25% of the variance in cybersickness, and that the latter in turn explains up to 16% of the variance in visuomotor performance. Unsupervised automatic analyses (by clustering) of head rotation patterns in their spatial (coefficient of variation) and temporal (fluctuation analyses) dimensions also allow participants to be separated into different groups according to their sensitivity to cybersickness, which opens the way to automatic and dynamic detection of negative symptoms.

*2022 **The Phi Angle: A Theoretical Essay on Sense of Presence, Human Factors, and Performance in Virtual Reality**, *Arthur MANEUVRIER (University of Caen, University of Montreal), Hannes WESTERMANN (University of Montreal, University of Maastricht)*.
PRESENCE: Virtual and Augmented Reality – [Scimago Q3; Google Scholar 6 citations]

This article synthesises and deepens the theoretical reflections arising from my doctoral thesis. After an updated literature review on the links between sense of presence and human factors in virtual reality (video game practice, gender/sex, cybersickness, flow state, attentional resources and ergonomics...), the distinction between immersion, presence and interfacing, as well as the various conceptions of the sense of presence and the epistemic approaches associated with them, this article proposes a new version of the Phi Angle model. Drawing on the factor analyses from previous studies, the Phi Angle model is seen as a way of understanding

the ecological dimension of performance in a virtual environment: the more a task is integrated into the spatial environment, seems natural and offers familiar affordances, the more the sense of presence will be associated with task performance, and the more one can speak of an ecological task. The article then proposes various ways of testing the model as well as exploratory directions for the study of the psychophysiology of virtual reality, notably using artificial intelligence and machine learning to neutralise the biases it can introduce in scientific and medical applications such as diagnostics, assessments or remediations.

*2022 **Virtual reality and neuropsychological assessment: An analysis of human factors influencing performance and perceived mental effort**, *Arthur MANEUVRIER (University of Caen, University of Montreal), Hadrien CEYTE (University of Nancy), Patrice RENAUD (University of Quebec in Outaouais), Rémy MORELLO, Philippe FLEURY, Leslie DECKER (University of Caen)*, Virtual Reality – https://doi.org/10.1007/s10055-022-00698-4.
[Scimago Q1, 917 direct accesses, Google Scholar 13 citations]

This article, arising from an experiment conducted during my doctorate, examines the impact of human factors (video game practice, cybersickness, gender, field dependence) when using virtual reality for neuropsychological purposes. The study compares ($N = 107$) the administration of a Wisconsin Card Sorting Test, either in its traditional paper-and-pencil version or in a virtual reality version. The measured data reveal similar results between the two versions, which appears to validate the use of the tool in this context. However, unsupervised multidimensional analyses within the group that took the test in virtual reality show that a particular perceptivo-cognitive profile (greater sense of presence, less cybersickness, less visual field dependence and more video game practice) is associated with a lower cognitive load. These results are discussed in the context of neuropsychological assessments in virtual reality in order to promote a more rigorous methodology, particularly when it is used to add an ecological dimension to laboratory diagnostics.

*2021 **Field (In)dependence Flexibility Following a Virtual Immersion Is Associated With Cybersickness and Sense of Presence**, *Arthur MANEUVRIER (University of Caen, University of Montreal), Leslie DECKER, Patrice RENAUD (University of Quebec in Outaouais), Gwénaelle CEYTE (University Aix-Marseille), Hadrien CEYTE (University of Nancy)*, Frontiers in Virtual Reality – https://doi.org/10.3389/frvir.2021.706712.
[Scimago Q1; 3196 direct accesses; Google Scholar 17 citations]

This article focuses on the sense of presence/cybersickness coupling according to field dependence as measured by the Rod and Frame Test, and notably according to its evolution. Indeed, participants' field dependence was measured before and after immersion in order to analyse potential changes and their relationship to virtual psychophysiology. Results show an overall decrease in field dependence. Moreover, this decrease in visual field dependence is associated with a poorer virtual reality experience. This phenomenon is interpreted as a consequence of a less adaptive cognitive-perceptual style. Indeed, an excessive degree of visual field dependence, often problematic in virtual reality, appears to trigger a change in multisensory integration as a compensatory mechanism for an ill-adapted mode, and this in order to avoid cybersickness. This article concludes by presenting the potential contributions of field dependence for predicting the user experience during virtual immersion.

*2020 **Presence promotes performance on a virtual spatial cognition task: Impact of human factors on virtual reality assessment**, *Arthur MANEUVRIER, Leslie DECKER (University of Caen), Hadrien CEYTE (University of Nancy), Philippe FLEURY (University of Caen), Patrice RENAUD (University of Quebec in Outaouais)*, Frontiers in Virtual Reality – https://doi.org/10.3389/frvir.2020.571713.
[Scimago Q1; 9739 direct accesses; Google Scholar 85 citations]

This article arising from my doctoral research examines the links between sense of presence and spatial

cognition in virtual reality. The performance of around fifty participants on a composite spatial cognition score was measured alongside their sense of presence, cybersickness and video game practice. Using classical inferential statistics (linear regressions), the results show that the sense of presence promotes spatial cognition performance while cybersickness symptoms reduce it, particularly among female participants. However, as gender presents no main effect, this is most likely a threshold effect, more frequently reached among female participants due to lower levels of video game practice. Indeed, an ancillary finding of this study shows that video game practice predicts a non-negligible portion of the sense of presence (10.5%) and cybersickness symptoms (10.4%). The results of this study are discussed in light of two distinct approaches to the sense of presence, but more broadly to cognition: the rationalist approach focusing on perception and representation of the virtual environment, and the enactivist approach focusing on interaction with the environment and affordances.

Clinical Project

2018-2020 **Starwalker: a virtual reality mini-game platform for the care of kinaesiophobic children**, *Arthur MANEUVRIER, Sophie MADELAINE, Valérie GUILLOUF*, CIREVE, Pain Assessment and Treatment Centre, Hôpital Clémenceau de Caen, Chapter in: "Chronic pain and cognitive-behavioural therapies, Foundations, efficacy, clinical case (2021)" Ed. Françoise Laroche and Philippe Roussel.

Pro bono clinical project funded by Pièces Jaunes. I developed this project and this application in partnership with child psychiatrist Dr. Valérie Guillouf, and this application is still in use within the department. The aim is to use immersive video mini-games to enable i) lower limb exercise and therefore motor rehabilitation and ii) a concurrent reduction in pain. The idea, akin to a hypnotherapy approach, was to have the child perform spontaneous movements through play and gradually increase the required range of motion in order to address their fear of movement resulting from a past trauma. For example, in one of the "Space Invader"-style mini-games, children used their feet to control a spaceship. Once the child was engaged in the game, it becomes possible to increase the movement sensitivity to elicit broader movements, and/or to film the child to show them the movements they were capable of performing, while providing playful and pain-distracting moments within the hospital ward.

Scientific Communications

2025 **DEEC: determining the effectiveness of controlled experiments in education**, *Presentation of ANR DEEC results to the DGESCO, Ministry of National Education, by the DEEC collective*, Section: methodology and statistical results, A. Maneuvrier.

2024 **Hybrid Text-Image-Sound Systems within the ANR DEEC**, *Canevas Huma-Num Conference*, J-N. Blocher, G. Sensevy, C. Journal, A. Maneuvrier, S. Guillaud-Lucet.

2024 **Presentation of ANR DEEC and its methodology**, *Celluloid MRSH Paris Nord Seminar*, A. Maneuvrier, S. Guillaud-Lucet.

2023 **The Starwalker Project: virtual reality video game and kinaesiophobia**, *Management of chronic pain in children, behavioural and cognitive approach, GT Chronic Pain Management, AFTCC*, A. Maneuvrier, V. Guillouf, S. Madeleine, V. Rivière.

2023 **Presentation of ANR DEEC and its methodology**, *VISA Study Days, École Normale Supérieure de Lyon*, A. Maneuvrier, S. Guillaud-Lucet, J-N. Blocher, J. Journal.

2022 **Psychophysiology of virtual reality**, *Lab-STICC Laboratory Seminar*, A. Maneuvrier.

2021 **Virtual reality and rehabilitation**, *BEaChild Project Seminar*, A. Maneuvrier.

2020 **Assessment and human factors in VR**, *COMETE Seminar, PFRS, Caen*, A. Maneuvrier.

2019 **Assessment and human factors in VR**, *LIF Seminar, IPPM, Montreal*, A. Maneuvrier.

2019 **Impact of human factors on performance in virtual reality**, *Department Days, University of Montreal*, A. Maneuvrier.

2017 **Presence & behavioural sciences**, *COMETE Seminar, PFRS, Caen*, A. Maneuvrier.

2016 **Presence & behavioural sciences**, *Virtualia Conference, Interdisciplinary Virtual Reality Centre, Caen*, E. Dupuy, A. Maneuvrier, L. Decker.

Other Published Articles and Book Chapters

2025 **Hybrid Text-Image-Sound Systems within cooperative engineering: methodology of the ANR DEEC**, *Journal C., Guillaud-Lucet S., Maneuvrier A., Blocher J-N*, chapter in "Audiovisual corpora in the humanities and social sciences", MkF Éditions.

2022 **Contribution of virtual reality to the understanding of coastal flooding hazards**, *Costa, S., Madeleine S., & Maneuvrier A.*, Bulletin de l'association de géographes français, Géographies, 98(3/4), 514–529.

2018 **Virtualia 2016: virtual reality in the service of research**, *Madeleine S. et al.*, Proceedings of the seminar organised by CIREVE in Caen.

2016 **Hypermobile Ehlers-Danlos Syndrome (hEDS): Evolution of postural strategies in response to a proprioceptive rehabilitation programme**, *Dupuy, E. G., Maneuvrier, A., Besnard, S., Bienvenu, B., & Decker, L. M.*, Neurophysiologie Clinique/Clinical Neurophysiology, 46(4), 256..

Academic Service

Scientific Committee **Congress of Cyberpsychology, CyberTherapy and Social Networking**, *27th edition (Tempe, Arizona, USA)*.

Reviewer **Virtual Reality (IF 4.4, Q1)**, Ongoing.

Reviewer **JMIR Aging (IF 4.8, Q1)**, Ongoing.

Reviewer **Éducation et didactique (IF 0.32, Q3)**, Ongoing.

Reviewer **Frontiers in Aging Neuroscience (IF 4.5, Q1)**, *Age-related directional asymmetry in the rod-and-frame test*, M. Adamski, M. Latka, A. Latka, S. Wudarczyk, T. Sebzda, B. J. West, 2026.

Reviewer **The Visual Computer (IF 4.3; Q2)**, *Gender influences on virtual reality colour matching task: performance, presence, usability, cognitive load, accuracy, and physiological response*, H. Namrouti, C. Sik-Lanyi, T. Guzsvinecz, 2026.

Reviewer **Virtual Reality (IF 4.4, Q1)**, *Cybersickness and sense of presence as predictors of VR task performance in individuals with and without Post-COVID-19 condition*, T. Llana, S. Garces-Arilla, S. Garcia-Navarra, M. Mendez-Lopez, M. Carmen Juan, M. Mendez, 2025.

Reviewer **Virtual Reality (IF 4.4, Q1)**, *DVP predicts the probability of becoming sick and dropout times during head mounted display based virtual reality*, S. Palmisano, S. Chia, J. Kim, R. S. Allison, 2025.

Reviewer **Plos One (IF 3.2, Q1)**, *In Rod We Trust – The Evaluation of a Virtual Rod and Frame Test as a Cybersickness Screening Instrument*, J. Josupeit, 2024.

Reviewer **Nature Communications (IF 15.7, Q1)**, *Numerosity estimation of virtual humans as a digital robotic marker for hallucinations in Parkinson's disease*, Albert, L., Potheegadoo, J., Herbelin, B., Bernasconi, F., & Blanke, O., 2024.

Reviewer **Virtual Reality (IF 4.4, Q1)**, *Testing the "differences in virtual and physical head pose" and "subjective vertical conflict" accounts of cybersickness*, Palmisano, S., Stephenson, L., Davies, R. G., Kim, J., & Allison, R. S., 2024.

Reviewer **Plos One (IF 3.2, Q1)**, *The virtual navigation toolbox: providing tools for virtual navigation experiments*, Müller, M. M., Scherer, J., Unterbrink, O. J. N., Egelhaaf, M., & Boeddeker, N., 2023.

Reviewer **Frontiers in Virtual Reality (IF 3.6, Q1)**, *Direct comparison of virtual reality and 2D delivery on sense of presence, emotional and physiological outcome measures*, Kuhne, C., Kecelioglu, E. D., Maltby, S., Hood, R. J., Knott, B., Ditton, E., Walker, F. R., & Kluge, M. G., 2023.

Reviewer **IEE VR, Scientific Reports, Frontiers in Psychology, Frontiers in Virtual Reality, Virtual Reality, Plos One**, 13 reviews not retained for publication.

Skills

Research Project Submission and Management

Ethics	Canadian federal certification "Ethics of Research Involving Human Beings", several submissions made to national and international ethics committees.
GDPR	GDPR certification from the MOOC of the Commission Nationale Informatique et Libertés. Constitution and monitoring of the Data Management Plan according to the ANR DEEC FAIR principles.
Open Science	Open Science Framework, involvement in PubPeer, open-source software community: Wikimédia, Framasoft, JASP, R, StackOverflow, Godot.

Implementation and Analysis

Programming	C#, Unity3D, openVR, .NET, Shell, Python, HTML/CSS, PHP/SQL, R.
Motor systems	Movement (VICON), posture, treadmill (GRAIL), eye-tracking (Tobii, Vive).
Physiology	Heart rate & respiration, skin conductance, experience with NIRS, EMG and EEG.
Statistics	Inferential & descriptive, linear analyses, regressions, multilevel, SEM, mediation, equivalence, power analyses, mixed and qualitative analyses, experience with Bayesian methods.
Signal	Non-linear and dynamic analyses (DFA...), pattern extraction.
Psychometrics	Factor analyses (PCA, CFA...), scores, questionnaires, behavioural grids.
AI	Classification, clustering, prediction, big data, conversational agents.
Multimedia	Blender, VR headsets (HTC), CAVE, GIMP, Audacity, Vegas Pro, OBS Studio.
Other	Windows, Linux/GNU, office software, Visual Basic, LaTeX, Github, Moodle, H5P.

Other Skills

Languages	French (native), English (fluent), Spanish (intermediate).
Environment	Awareness of the environmental impact of digital technology and VR, repair and recycling of electronic devices (computers, phones, tablets...).
Writing	Development and implementation of scenarios for role-playing games, short story writing.
Arts	Music (solo pianist, rock jams, digital composition), photography (landscapes, wildlife).
Video games	Creation of video games and immersive experiences, participation in hackathons and game jams (Indie Collective in Rennes, Société des Arts Technologiques in Montreal).

Technological Productions

2025 **ANR DEEC website**, *development of the ANR DEEC website (Wordpress).*

2025 **DEEC experimental platform**, *Design and development of a platform supporting the experimental sequence (150 users) which will become an autonomous MOOC-style learning system (Moodle H5P / HTML5, Celluloid).*

2022 **SpaceShooter**, *virtual environment, CC-BY-SA, Unity3D and C#. Design and development of an automated visuomotor performance assessment system for the ChronoVR study. After an automated tutorial, participants are immersed for 13.5 minutes in a cartoon-style 3D environment set in the American Far West. Standing on a train, they must defend it by shooting with a tracked controller (hand + pistol) at aliens appearing in a pseudo-randomised manner. The experimenter can choose from 4 conditions determining task difficulty: easy / normal / difficult / adaptive. In the last condition, task difficulty adapts to participants' performance by automatically decreasing or increasing in order to promote a flow state: enemy hit points increase ordinally as long as the train is not hit by at least 1 projectile in the last 10 seconds. Performance variables and movements/rotations are exported automatically..*

2022 **Multipic**, *Android application, CC-BY-SA, Unity3D and C#. Co-design and development of a tablet application assessing inhibitory capacities in bilingual children. During the first part, 50 drawings (extracted from the MultiPic database) are presented to the child (25 cognates and 25 non-cognates) who must name them verbally. In a second phase, the child must write the name of these 50 items in the presence of 8 distractors (in English) placed randomly around the drawing. Drawings, response initiation times and completion times are recorded. Used at Scalab for master's dissertations (dir. S. Casalis)..*

2022 **Virtual Rod and Frame Test**, *virtual environment, CC-BY-SA, Unity3D and C#. Design and development of an automated VR administration system for Witkin's Rod and Frame Test. After a fully automated tutorial (visual and auditory modalities), participants must replace a red rod on the absolute vertical within a tilted frame. The inclinations of the rod and frame can be modified, as well as the number of trials. Interaction is carried out with the tracked controller or keyboard buttons (or other controllers). Data are recorded automatically, per participant, with associated parameters. This test is currently used by several teams at multiple universities and has been used in several scientific publications..*

2021 **Starwalker**, *virtual environment, CC-BY-SA, Unity3D and C#. A VR mini-game application designed to be played with the feet, without a controller. This application includes several mini-game classics (space invader, breakout...) and was developed for the playful lower limb rehabilitation of kinaesiophobic children..*

2020 **PhiVR**, *.NET application, CC-BY-SA, Unity3D and C#. Design and development of an application for VR users to i) determine a priori the perceptivo-cognitive profile of participants, ii) determine the immersive and kinetogenic capabilities of the virtual environment and iii) estimate the expected virtual experience based on the interaction between the first two components. To do this, the user simply answers a number of questions via a graphical interface. The software evaluates the profile, the immersive system and their interaction, according to a weighting system derived from empirical data on the topic. A confidence score is associated with this evaluation, based on the amount of information provided..*

2019 **HanoiVR**, *virtual environment, CC-BY-SA, Unity3D and C#. Design and development of an automated VR administration system for the Tower of Hanoi to assess executive functions and notably planning. Interaction is performed with the controller. The initial configuration is that of the Tower of London test, but the number of discs can be modified. Data from each attempt and error are exported automatically.*.

2019 **Spatiopresence**, *virtual environment, CC-BY-SA, Unity3D and C#. Design and development of an automated spatial cognition assessment. After a tutorial, participants follow a signposted tour in an Ancient Rome 3D urban environment. Afterwards, various questions are automatically posed to assess spatial memory (cues, presentation order of visual photographs, route choice...). Participants are then sent back to the start of the tour and invited to reproduce the route, without the markers to guide them. Position is recorded in real time, along with responses to questions and the number of errors made.*.

2019 **CIREVE website**, *co-webmaster of the CIREVE website (Wordpress).*

2018 **Neuropresence**, *virtual environment, CC-BY-SA, Unity3D and C#. Design and development of an automated executive function assessment developed with Charline Madelaine, neuropsychologist. After an automated tutorial in this environment inducing a mild sensory conflict through an optic flow, participants are confronted with an automated version of the Wisconsin Card Sorting Test by interacting with tracked controllers. The explored environment is a cartoon-style city. Responses and stimuli are recorded automatically.*.

2016 **Threat**, *virtual environment, CC-BY-SA, Unity3D and C#. Design and co-development of a threatening virtual environment used to measure the sense of presence, largely inspired by Meehan's (2001) PitRoom: in the first condition, the user explores a dungeon environment walking on wooden planks on the floor. In the second condition, the floor has collapsed and participants must walk on the planks above a drop of around ten metres. Finally, in the last condition, a monster suddenly appears in front of participants.*.

2016-2020 **Virtual Reality Rooms**, *setup, maintenance and technical support of the immersive rooms at the LIF at the IPP in Montreal (MiddleVR) and at CIREVE in Caen (CryEngine).*

Scientific dissemination

2024 **Virtual reality: a tool that has become an object of research**, *Popular science article in the ACFAS Magazine*, Research narrative, A. Maneuvrier.

2021 **Virtual reality in psychology, Conference & discussion**, *Conference for UBO students*, Brest, A. Maneuvrier.

2021 **Meet the French laureate of the Franco-Québec joint PhD thesis prize**, *Interview for ACFAS and the Consulate General of France in Quebec*, Research narrative, A. Maneuvrier.

2020 **Virtual reality, an answer without a question?**, *Pint of Science*, A. Maneuvrier.

2018 **Discovering research in the humanities and social sciences: Virtual reality, immersion and neurosciences**, *Conference & discussion*, Dôme de Caen, A. Maneuvrier.

2018 **In Caen, virtual reality in the service of medical research**, *Article in Tendance Ouest*, Research narrative, A. Maneuvrier.

2017 **Science Festival: posture and virtual reality**, *Hands-on science workshops*, Faculty of Sciences, Caen, A. Maneuvrier, L. Decker.