

Caroline Dakoure

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<https://carodak.com> | <https://github.com/carodak/>

Profile

- ∴ Strong interest in the ethical use of new technologies with a positive impact on society
- ∴ Strong communication skills, especially for collaboration and mediation
- ∴ Analytical mindset, conscientious, and attention to detail
- ∴ Languages: French and English

Specific knowledge

Game Engine: Unity
Python, Scheme, Bash

DevOps Automation Tools: Docker

Data Management: SQL, SGBD MySQL,
Castor, Redcap

Programming Languages: C#, C, C++, Java,

Machine Learning: Librairies Scikit-learn, Numpy,
TensorFlow, Keras, PyTorch, etc.

Web: PHP, React, Javascript, HTML5, CSS3,

Work experience

Software Developer, Centre de Recherche Douglas, Québec

2020-Now

- ∴ Lead the development of VR applications: [MRI Simulation](#), Lobby Room (Unity, C# with design patterns), from requirements analysis to production; design, development, testing, optimization, and [Meta Store deployment](#)
- ∴ Conceptualize and lead the development of web applications using React, PHP, JS, HTML, CSS (e.g., a match-3 puzzle game with [procedural content generation](#), and an [e-learning platform](#))
- ∴ Analyze XR (AR/VR) requirements and learn new computer techniques to address them
- ∴ Develop [cognitive tests](#) in Python and JavaScript and create Python scripts to automate tasks
- ∴ Supervise, mentor, and share expertise with new members of the programming team
- ∴ Provide recommendations on computer system-related issues

Student trainee in a Computer Science and Research Laboratory LIRMM,
Montpellier, France

2017

- ∴ Experiment deep learning (Keras, TensorFlow, Scikit-learn) and node2vec (with Networkx) algorithms to learn new representations of the features and get better predictions
- ∴ Implement an architecture in Python with several classifiers (neural network, decision tree) to determine graph properties (e.g., planarity, and tree structures)

Student projects and personal achievements

VR environments that change according to the patient's emotions, master's
thesis at UdeM

2020

- ∴ Develop adaptive [VR environments](#) using Unity3D and C#
- ∴ Create an NPC pathfinding & Goal-Oriented Action Planning system.
- ∴ Coordinate paired programming to develop a [ML classifier for emotion detection](#)
- ∴ Plan tasks to meet company deadlines & participate in team meetings
- ∴ Find strong scientific theories to choose appropriate environments

Achievements: Created two real-time changing virtual reality (VR) environments using Unity3D based on patients' emotions. Developed a machine learning model using Python to detect the intensity of confusion (ranging from 0 to 1) from EEG signals.

Development of procedural content as part of a course on modern computer games at McGill **2018**

- ∴ Simulate the behavior of various types of agents (steering behaviors, collision detection, procedural content generation, game physics)
- ∴ Develop a system where movement is based on directional forces

Achievements: Created a simulation in Unity3D and C# featuring three different types of agents. Some agents needed to reach an exit while others interfered or socialized.

Other Achievements

Participant, MIT Reality Hack 2025 **2025**

- ∴ Over 5days, we developed [a musical game in MR](#) using Unity

1st price, Winner of the NeuroVR Hackathon 2024 organized by McGillXR **2024**

- ∴ Over 24hours, we developed [the first version of an MRI simulation](#) in VR using Unity

1st price in a Competition, Winner of the 2019 Serene-Risc CyberStats Challenge **2019**

- ∴ Creation of [an informative poster](#) to promote awareness messages on Cybersecurity and Cybercrime using data from Statistics Canada's and presentation at GoSecure 2019

Education

Master's Degree in Computer Science (Artificial Intelligence) **2020**

[Adaptive VR Emotional Environments](#)

Under the direction of Dr. Claude Frasson, University of Montreal

Bachelor's Degree in Computer Science **2017**

Université de Montpellier, France

Scientific High-School Diploma (specialization in Mathematics) **2014**

Lycée Jacques Prévert, Saint-Christol-lès-Alès, France

Publications

Scientific publications: <https://orcid.org/0000-0002-3195-3643>

- **Dakoure, C. et al. (2026)**. Procedural trial generation for cognitive assessment: An executive function planning task. *BRM*.
- Sousa, A. E., **Dakoure, C. et al. (2025)**. E-Cog: An online training platform for cognitive health interventions based on the ADDIE model. *Digital Health*.
- Seon, Q. et al., **Dakoure, C. (2025)**. Virtual reality offerings for and by marginalized populations: A scoping review on equity and intersectionality. *Global Mental Health*.
- **Dakoure, C. et al. (2021)**. Confusion detection using cognitive ability tests. *International FLAIRS Conference Proceedings*.
- **Dakoure, C., et al. (2020)**. Virtual Savannah: An effective therapeutic and relaxing treatment for people with subjective cognitive decline. *LNCS*.

Social implications

Mentor during McGillXR Hackathon (2025), **Bikes Upcycling** for Togo at CycloNordSud (2023), **Animal Care** at Café Chato (2022), and **Participant Welcoming and Registration** for "Ça va aller" campaign event at UdeM (2019)