Marc-André Carbonneau

4690, boul. Saint-Michel
Montreal, Qc, Canada
H1Y 3M3
Phone: 1 438 829 8933
marcandre.carbonneau@gmail.com
personal website

Languages: French & English
Personal Qualities: Excellent communication abilities, conscientious, dynamic, autonomous and self-motivated
Research Interest: machine learning, deep learning, speech, signal processing, computer vision

About me:
I am currently principal research scientist at Ubisoft La Forge. I lead a group of researchers working on various subjects related to video games. The group consists of over 20 research scientists, developers, and post-graduate students working on generative models, speech, animation, machine learning, and computer vision.

Under my leadership, my team delivered dozens of innovative prototypes that are used as production tools in a wide range of applications, such as speech synthesis and analysis, facial and body capture, character and animation generation, and dialogue management. In addition, over the last two years, we have published in venues such as CVPR, ECCV, NeurIPS, Interspeech, ACL, EMNLP, Signal Processing Letters, and Computer Graphics Forum. I was directly involved in the problem definition, solution design, and paper writing for all of these publications.

Education

Doctorate of Philosophy (2012-2017)

École de technologie supérieure, Montreal, Canada
Specialization: Machine Learning
Thesis Title: Multiple Instance Learning Under Real-World Conditions
Thesis and defense received the mention “Excellent”
Submitted for the “Best Thesis Award”

Electrical Engineering Degree (2000-2010)

École de technologie supérieure, Montreal, Canada
Specialization: Information Technologies

Technician Degree in Electronic Conception (1997-2000)

Cégep de Trois-Rivières
3-year professional program

Work Experience

Principal Research Scientist (2023-present)

Ubisoft Entertainment – Video game studio
I lead a team of researchers working on diverse topics related to video games.
Key Responsibilities:
- Supervise a team of researchers, developers and students.
- Identify impactful research topics and create programs across multiple domains.
- Communicate with company stakeholders and academic partners.
- Write and publish scientific papers.
- Mentor mid-career researchers.

Research Scientist (2017-2023)

Ubisoft Entertainment – Video game studio

I led a team of researchers focused on machine learning, speech, and sound for video games.

Key Responsibilities:

- Supervise a team of researchers, developers, and students.
- Develop and execute research plans.
- Implement deep learning prototype models.
- Communicate with company stakeholders and academic partners.
- Write and publish scientific papers.
- Mentor early-career researchers.

Machine Learning Consultant (2013-2017)

Stelpro, ALIA Conseil, Aheeva and Quattriuum

During my Ph.D. studies, I contributed to collaborative projects between the university and several industry partners, focusing on computer vision, machine learning, reinforcement learning, and signal processing.

Key Responsibilities:

- Conceive system architectures.
- Review relevant literature.
- Conduct experiments and analyze results.
- Write grant proposals and scientific articles.

Lecturer (2012-2017)

École de technologie supérieure

During my Ph.D. studies, I taught university courses as principal lecturer and/or T.A.

Courses:

- Neural Networks and Artificial Intelligence
- Biometric Systems
- Conception and Realization of Numerical Systems
- Media Arts: Interactivity, Ubiquity and Virtuality (Université du Québec à Montréal)

Printed Circuit Board Designer (2001-2009)

Mechtronix Systems – Flight simulator manufacturer

I designed both analog and digital circuits to replicate aircraft instruments.

Key Responsibilities:

- Design microcontroller-based and programmable logic PCBs.
- Lead electrical engineers and designers in system conception.
- Review and approve schematics and PCB designs.

Production Support and New Product Integration Internship (2009)

Touchtunes Digital Jukeboxes – Electronic jukeboxes manufacturer

4-month internship during my engineering degree

Key Responsibilities:

- Prepare the first production run for new products.
- Provide technical support to assembly sites.
- Write technical documentation.

Other Experiences

Industry and other talks

Aside from scientific conferences, I gave technical talks at the world-renowned **Game Developer Conference 2021 (GDC), Montreal International Game Summit 2017 (MIGS)** and **CAMDEA 2021**. Projects that I instigated and supervised were also presented by my colleagues at **GDC 2023**. I also was invited as keynote speaker for **Medical Applications with Disentanglement MICCAIWorkshop 2022**.

Speech Synthesis in the Context of Video Gaming (GDC 2021)
MIGS 2017
CAMDEA 2021
Machine Learning Summit: Natural Language Generation for Games Writing (GDC 2023)
Ghostwriter in the press (GDC 2023)
VoRACE: Tools for Automating Dialogue Processing (GDC 2023)
Medical Applications with Disentanglement (MICCAI Workshop 2022)

Art Projects

I designed and developed digital art pieces with professional artists such as Jean Dubois and Laurent Lamarche. The pieces were interactive installations mixing hardware and software. Both were presented in several museums in different countries and got press coverage.

La nuée 2017
BrainStorm

Scientific conference Volunteering

I served as **publication chair** for the IEEE International Conference on Image Processing Theory, Tools and Applications (IPTA2017), as **organizer** of the Large Scale Annotation of Biomedical Data and Expert Label Synthesis (LABELS) Workshop at MICCAI 2017, and as **session chair** at ICASSP 2022.

OTHER INTERESTS

I play several musical instruments such as guitar, bass and clarinet. I operate a modest recording studio and produce songs in various styles.

I love cooking, fermenting, gardening and playing video games.

Selected Publications

I was the principal author of these publications, or they were written under my close supervision.
These are my favorite contributions, but there are more on my complete scholar profile.

M.-A. Carbonneau, V. Cheplygina, E. Granger, G. Gagnon, "Multiple Instance Learning: A Survey of Problems and Applications", Elsevier Pattern Recognition, 2018

M.-A. Carbonneau, J. Zaidi, J. Boilard, G. Gagnon, "Measuring disentanglement: A review of metrics", IEEE Transaction on Neural Networks and Learning Systems, 2022

B. van Niekerk, **M.-A. Carbonneau**, J. Zaïdi, M. Baas, H. Seuté, H. Kamper, "A Comparison of Discrete and Soft Speech Units for Improved Voice Conversion", ICASSP, 2022

S. Ghorbani, Y. Ferstl, D. Holden, N. F. Troje, **M.-A. Carbonneau**, "ZeroEGGS: Zero-shot Example-based Gesture Generation from Speech", Computer Graphics Forum, 2023

A. Dib, L. G. Hafemann, E. Got, T. Anderson, A. Fadaeinejad, R. M.O. Cruz, **M.-A. Carbonneau**, "MoSAR: Monocular Semi-Supervised Model for Avatar Reconstruction using Differentiable Shading", CVPR, 2024

V. Davoodnia, S. Ghorbani, **M.-A. Carbonneau**, A. Messier, A. Etemad, "UPose3D: Uncertainty-Aware 3D Human Pose Estimation with Cross-view and Temporal Cues" ECCV, 2024

G. Lopez Latouche, **M.-A. Carbonneau**, B. Swanson, "BinaryAlign: Word Alignment as Binary Sequence Labeling", ACL 2024

G. Lopez Latouche, **M.-A. Carbonneau**, B. Swanson, "Zero-shot Cross-Lingual Transfer for Synthetic Data Generation in Grammatical Error Detection", EMNLP 2024

G. Zhu, Y. Wen, **M.-A. Carbonneau**, Z. Duan, "EDMSound: Spectrogram Based Diffusion Models for Efficient and High-Quality Audio Synthesis", NeurIPS Machine Learning for Audio Workshop 2023

B. van Niekerk, **M.-A. Carbonneau**, H. Kamper, "A Comparison of Discrete and Soft Speech Units for Improved Voice Conversion", Signal Processing Letters, 2023

J. Zaïdi, H. Seuté, B. van Niekerk, **M.-A. Carbonneau**, "Daft-Exprt: Robust Prosody Transfer Across Speakers for Expressive Speech Synthesis", INTERSPEECH, 2022

M.-A. Carbonneau, E. Granger, Y. Attabi, G. Gagnon, "Feature Learning from Spectrograms for Assessment of Personality Traits", IEEE Transactions on Affective Computing, 2017

M.-A. Carbonneau, E. Granger, G. Gagnon, "Bag-Level Aggregation for Multiple Instance Active Learning in Instance Classification Problems", IEEE Transaction on Neural Networks and Learning Systems, 2017

A. Langevin, **M.-A. Carbonneau**, M. Cheriet, G. Gagnon, "Energy disaggregation using variational autoencoders", Elsevier Energy and Buildings, 2022