





VIOLET I JOHNSON

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PhD candidate with 5+ years research-focused software engineering experience & 4 years related teaching experience. Seeking full-time roles (July '24) in Game Dev, DSP, VR, Robotics, HCI, & ML.

EDUCATION

University of North Texas, <i>PhD in Computer Science & Engineering</i> TX, USA		July 2024
University of North Texas, <i>MS in Computer Science & Engineering</i> TX, USA	3.8 / 4.0	May 2017
University of North Texas, <i>BS in Computer Science, Minor in Mathematics</i> TX, USA	3.2 / 4.0	May 2013
Aspirations in Computing Award Finalist, 2024, NCWIT Game Programming Certification, 2014, Univ. of North Texas		

DISSERTATION

“Convolutional Neural Networks in the Domain of Non-Lexical Audio Signals” Published Jul 2024
The intersection of convolutional neural networks and raw non-lexical audio signals by detailing the development and results of projects in mutation detection, upscaling, classification, and generation.

EXPERIENCE

- University of North Texas Dept of Comp Sci & Eng, Teaching Faculty, Instructor** | TX, USA Jan 2022 - May 2022
- Game Programming II - Game development from scratch in both Unreal & a pure C++/DirectX engine.
 - Curriculum design, development of teaching tools, lecturing, grading, & directing labs.
- University of North Texas Dept of Comp Sci & Eng, Teaching Assistant** | TX, USA (Hybrid) Aug 2020 - Present
- Game Programming I & II - C++/DirectX & Unreal game dev programming. | Game Math & Physics - OOP linear algebra physics system programming for games. | Computer Science I & II - Software design, structured programming, OOP, C/C++ basics. | Database Admin I & II - Postgresql management. | (More courses unlisted)
 - Curriculum design and deployment, individual tutoring, grading, & directing labs.
- University of North Texas, xRez Lab, CVAD, Lead Research Assistant** | TX, USA Aug 2014 - Jul 2018
- Development of hybrid art-science interactive exhibitions, with focus on 3D data-driven multiplayer VR experiences. The projects I lead in this role involved parsing large scientific datasets into collaborative exploration tools.
 - Many systems and languages, primarily: Unity, C#/C++, Python, MySQL, PD, Max/MSP, HLSL, & OpenCV.
- University of North Texas, College of Engineering Web Developer** | TX, USA Aug 2012 - Jul 2014
- Maintained the college's primary website, full stack.

PROJECTS

- Generative raw audio adversarial networks** - implemented around 150 GAN architectures including the structurally novel PrismGAN & SBIGAN, for controlled experimental comparison.
- Music upscaling** - dilated CNN for raw audio music super-resolution.
- Instrument sample classification** - compact CNN for supervised raw audio sample separation.
- Data mutation detection** - dilated CNN for detecting the injection of steganographic messages in online game traffic.
- Transform-robust art classification and activation visualization** - deep CNN for binary classification of images as human-made art and activation visualization for the purpose of understanding conceptual representation.
- Instrument: One Antarctic Night** - Multiplayer VR art-science exploration system utilizing antarctic telescope data. provides a VR interface where users are placed inside the cloud of astronomical bodies and can explore them through manual manipulation while using the points to collaboratively compose with data-driven procedural sound.
- Binaural Positional Audio Simulation** - Using sine-sweep inverse convolution and a binaural microphone array, provides a system for artificially positioning audio in a 3D space as a real-time software effect (similar to HRTFs).
- Audio-only experimental game** - Utilizing xAudio and positional audio tools, a 3D world simulation with no graphical interface developed to study human are capacity for audio-only navigation of game worlds.
- WavRide** - A 3D rhythm game wherein a music track is split into stems which can be activated by a player one by one, with the goal of maintaining the full composition.
- Stick Fighter** - A 2D fighting game with stick figure characters. Standard fighting game features including a gravity and scaling based juggle system.
- Bot** - A simple 3D platformer designed around technical movement, with features such as wall-runs and wall-jumps.

SKILLS

Languages Python, C/C++, C#, HLSL, Java, CUDA, Matlab, Git, Bash, LaTeX, PHP, Postgres/MySQL, DirectX
Software Linux, Tensorflow, Theano, Keras, Pytorch, OpenCV, Unity, Unreal, PD, Max/MSP, Many DAWs

PRIMARY PUBLICATIONS

- V. Johnson, I. Parberry** (2020). Music Upscaling Using Convolutional Neural Networks. *2020 3rd International Conference on Sensors, Signal and Image Processing (SSIP 2020)*, 58-62
- R. West, V. Johnson, I.C. Yeh, Z. Thomas, E. Mendelowitz, L. Berg** (2018). Instrument | one antarctic night. *ACM SIGGRAPH 2018 Art Gallery (SIGGRAPH '18)*, 439-440
- R. West, V. Johnson, I.C. Yeh, Z. Thomas, M. Tarlton, E. Mendelowitz** (2018). Experiencing a slice of the sky: Immersive rendering and sonification of Antarctic astronomy data. *Electronic Imaging: The Engineering Reality of Virtual Reality 2018*
- J.P. Lewis, I.C. Yeh, A. Migalska, V. Johnson, R. West** (2017). Exploring the definition of art through deep net visualization. *31st Conference on Neural Information Processing Systems*
- M. Parola, V. Johnson, R. West** (2016). Turning presence inside-out: MetaNarratives. *Electronic Imaging 4: 1-9*
- V. Johnson, R. Renka** (2016). Triangle mesh generation combining edge splitting and angle-based smoothing. *Posters, 25th International Meshing Roundtable, Sandia National Laboratories*