

# Alexander Bohdan Woskob

## Interactive Digital Media

Carnegie Mellon University | Bachelor of Arts | May 2019  
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### Summary

I am a creative programmer and graduate of Carnegie Mellon University with a degree in **Interactive Digital Media**. I have professional training in **game design**, **visual art**, **3D animation**, **human-computer interaction**, **violin performance**, **sound engineering**, and **composing music** for ensembles and multimedia platforms.

I developed and presented several **AR** and **VR** experiences at the Building Virtual Worlds Festival 2018 hosted by Carnegie Mellon's Entertainment Technology Center. I helped develop an **Alexa Skill** called Let's Practice which is a voice-controlled music practice application for Amazon's Alexa. The presentation at the Carnegie Mellon's School of Computer Science in April 2019 was awarded first place out of 19 teams.

I studied **violin and piano performance** with esteemed musicians and professors Jack Kurutz, Jim Lyon, Chris Wu, and Andres Cardenes. My love for music extends to many disciplines such as **performance**, **composition**, and **multitrack recording**. I composed and performed my own music with Carnegie Mellon's Exploded Ensemble at TEDxCMU in 2017. I also compose, perform, and produce all the sound for video games I develop, such as Duck Falls which was awarded the People's Choice award at Pittsburgh's Global Game Jam 2017.

I worked as a **personal contractor** in **sound recording** for the Pittsburgh Digital Recording & Editing Company under the direction of Riccardo Schulz—capturing professional quality recordings of ensembles such as the Pittsburgh Opera and Chatham Baroque. I also worked for the radio station WQED Pittsburgh—helping record and edit performances by visiting musicians and **writing scripts** for Jim Cunningham's show *Voice of the Arts*.

I thrive in high-pressure creative environments and excel in managing multiple projects to meet critical deadlines.

### Skills

#### Programming Languages

C#, C, Python, Javascript, HTML/CSS

#### Software

Unity, Ableton, Max/MSP, Pro Tools, FMOD, Blender, Maya, Photoshop, Premiere, After Effects

#### Tools & Frameworks

Node.js, p5.js, three.js, tone.js, Express

#### Hardware

HTC Vive, Oculus Headsets, Kinect, Meta 2, Leap Motion, Raspberry Pi, Arduino

### Computer Science and Game Design Courses

15-112 Fundamentals of Programming  
15-122 Principles of Imperative Computation  
05-499 Human-Computer Interaction: Accessibility  
15-615 Machine Learning and Art  
53-451 Research Issues in Game Development  
53-471 Game Design, Prototyping and Production  
53-532 Building Virtual Worlds

### Music and Sound Recording Courses

18-090 Multimedia Processing for the Arts  
57-338 Sound Editing and Mastering  
57-344 Experimental Sound Synthesis  
57-438 Multitrack Recording  
54-267 Conceptual Sound Design  
15-322 Introduction to Computer Music  
57-505 Violin Performance Major Studio

## Projects & Presentation

### **“Gravity Sound”, a Virtual Reality Space Simulator and Sound Installation – Dec. 2017**

(Solo) Gravity Sound is an interactive simulation of our solar system which can be experienced in virtual reality and on a desktop. Its function is to sonify the force of gravity through a mechanical-acoustic metaphor. Imagine connecting the planets in our solar system by strings where each string's tension was determined by the force of gravity between two connected planets. What would our solar system sound like if one were to bow these strings as the planets orbit? How much would each string vary in pitch along different parts of orbit? Gravity Sound quenches those curiosities. It is possible to find the fundamental vibrational mode of a stretched string given its mass, length, and tension. Using data provided by NASA and JPL ephemerides, I accurately simulate the positions of the planets in our solar system from roughly 20,000 BCE to 20,000 AD. With a Pure Data embeddable audio synthesis library inside of Unity I procedurally generate the different string sounds and sonically spatialize them for a 360 degree immersive experience. A user is able to pick a date, create their own string alignments between planets, set the planets in motion at any variable speed, create new planets, throw them into orbit, and navigate outer space to experience a unique sonification of the solar system. Gravity Sound was debuted at the Subsurface Music Festival in 2017.

### **“Duck Falls”, a Multiplayer 2D Platformer – People’s Choice Award at Pittsburgh Global Game Jam – May 2017**

(Team) Duck Fall is a collaborative multiplayer 2d video game developed for the Pittsburgh Global Game Jam. Players must work together to try to save a rubber duck from falling off a waterfall. The game encourages communication and synchronized actions. Duck Falls was awarded the People’s Choice Award. I was a lead designer, programmer, and sound designer.

### **“Qme”, a Dating Game App – Presented to a Panel at the Entertainment Technology Center – May. 2019**

(Team) Qme is a mobile dating game app which I prototyped for Game Design, a class at the Entertainment Technology Center taught by the CEO of Schell Games, Jesse Schell. The application allows users to video record themselves asking a question on their profile which can then be answered by any other profile on the app so long as they are willing to start recording a video response within 10 seconds of viewing the question. The sense of urgency in the method of interaction is meant to encourage genuine and candid communication between profiles. I was the lead designer for the project and presented in front of a panel of industry professionals who positively received our pitch, including Bob Bates, Rich Vogel, Seth Sivak, Kim Voll, and Tim Train.

### **“Cook and Ruin”, an Interactive Story for Meta II – Presented at the Building Virtual Worlds Festival – Sep. 2018**

(Team) Cook and Ruin is an augmented reality application for the Meta II. It is an interactive story which begins with the player receiving a letter from their grandmother inviting them to Grandpap’s 100th birthday party. The grandmother asks the player to ruin the dinner so that Grandpap will want to go home because she is worried that her sister who is hosting the party wants to seduce Grandpap. The story cuts to a dinner scene where Grandpap states “the doctor says I shouldn’t eat spicy food. My brain will overheat!” and “I like my fish juicy!” The player subsequently must throw as many chillies as they can into the ramen and burn as many fish as possible without being seen by the grandmother’s sister. If done correctly, Grandpap will breath fire, throw the burnt fish on the floor, and jump into grandmother’s arms on his way out. I was the lead designer, script writer, sound designer, and voice acting director. Cook and Ruin was presented at the Building Virtual Worlds Festival hosted by the Entertainment Technology Center.

### **“Punch Buggy”, a Video Game for Microsoft Kinect – Oct. 2018**

(Team) Punch Buggy is a multiplayer game for Microsoft Kinect utilizing motion tracking. Players fight each other during a car chase with characters who have spring loaded punches. It was developed for the Entertainment Technology Center and I was a lead designer, and sound designer.

**“Woo Who”, an Interactive Story for Virtual Reality - Presented at the Building Virtual Worlds Festival - Dec. 2018**  
 (Team) Woo Who is an interactive story for virtual reality. It is a parody of balcony serenading scenes found in classic literature such as Romeo and Juliet, and Cyrano de Bergerac. The player must find a way to impress the princess on her balcony with the help of their Fairy Frog Father, Don Toadlioni. The player must compete with another suitor for the princess, but ends up attracting someone unexpected. The story is intended to subvert expectations and is full of surprises and comedy. I was the lead designer, programmer, sound designer, script writer, and voice acting director. Woo Who was presented at the Building Virtual Worlds Festival hosted by the Entertainment Technology Center.

**“Pollen Nation”, a Video Game for Virtual Reality and Three Xbox-Controllers - Nov.-Dec. 2018**  
 (Team) Pollen Nation is an asymmetrical multiplayer survival game where one person in VR plays as a Mantis who fights three other bees played with Xbox controllers. The game was developed for Carnegie Mellon University Entertainment Technology Center and utilized a 12:1 sound installation which encapsulated the VR player on all sides. I was the lead designer, sound designer, and composer of the original soundtrack.

**“Loop 31”, an Original Composition for Exploded Ensemble Performance at TEDxCMU - Mar. 2017**  
 (Solo) I composed and performed an original piece for Carnegie Mellon’s Exploded Ensemble which was featured at TEDxCMU. The piece was written for up to 15 performers and a variety of instruments, including strings, piano, brass, and electronics.

**“Martian Invasion”, a Video Game for Virtual Reality and Four Xbox-Controllers - Jan. 2019-Present**  
 (Solo) Martian Invasion is an asymmetrical multiplayer survival game where one player in VR controls a UFO with the chair they are sitting on and four other players use Xbox controllers to drive cars, avoid abduction, and shoot down the UFO. I built a chair which uses two HTC Vive Trackers to detect the direction the player is facing, and how much they are leaning forward and backward—which in turn flies the UFO. The chair incorporates programmable DMX lights and LEDs which respond to events in the game and create an immersive experience for those outside of VR. This project will be exhibited in Pittsburgh’s LikeLike gallery in August, 2019.

**“Let’s Practice”, an Alexa Music Practice Skill - First Place Presentation at Alexa Day - Nov. 2018-Present**  
 (Team) I helped program an Alexa skill called Let’s Practice which is a voice-controlled music practice application for Amazon’s Alexa. As a team of three, we developed a Music Practice skill, that contains a music theory and ear training game, a user progress database, and contains metronome and drone functions. The project was developed with Node.js. The presentation at Carnegie Mellon’s School of Computer Science in April 2019 was awarded 1st place out of 19 teams.

**“Hansel and Gretel: Hungry for Revenge”, a 2D Platformer - Presented at Meeting of the Minds - May 2017**  
 (Team) I was the game designer, composer, and sound designer of a 2D platformer video game developed for PC/Mac which was presented at Meeting of the Minds hosted by Carnegie Mellon University. The project was developed with Unity and involved a complex physics engine.

**“Space Buccaneer”, Art and Machine Learning Final Project - May 2018**  
 (Solo) I developed a video game simulation which challenges a trained machine learning agent named Zelboc to reach his spaceship by traversing a treacherous landscape. In order to safely reach his destination, Zelboc must be skilled in running, jumping, and platforming. Zelboc was trained using a learning technique called Proximal Policy Optimization. It is a recurrent neural network implemented in TensorFlow that optimizes an agent's acquired reward by mapping an action to a state of observations. Zelboc is capable of seven different actions and endured 2.0e6 frames of in game training to reach his current state of intelligence. The environment was built in Unity and communicates with TensorFlow over a python socket.

## Work Experience

### **Management and Maintenance, GN Associates** – *2010–Present*

Every summer I work for our family business, GN Associates. GN Associates owns and manages student housing at Pennsylvania State University in State College, PA. When the apartments turnover during the summer, I do administrative work in the offices, help students register for their lease, inspect apartments, as well as on-site maintenance for incoming tenants.

### **Hardware Engineer, Gridless Power** – *May.–Aug. 2015*

I assembled hardware for the startup Gridless Power in Collingswood, NJ. Their products include large batteries meant for emergency relief and solar panels for harnessing emission-free energy. I would assemble and test all the components of every unit—such as gps systems, fan systems, and displays.

### **Script Writer and Show Editor, WQED Pittsburgh** – *Jan.–May. 2016*

I worked for the radio station WQED Pittsburgh—helping record and individually edit performances by visiting musicians for Jim Cunningham’s show *Voice of the Arts*. In addition to editing the show I also **wrote scripts** and would occasionally record my own voice to be aired.

### **Sound Engineer, Pittsburgh Digital Recording & Editing Company** – *Jan. 2016–Aug. 2018*

I worked as a personal contractor in sound recording and engineering for the Pittsburgh Digital Recording & Editing Company under the direction of Riccardo Schulz—capturing professional quality recordings of ensembles such as the Pittsburgh Opera and Chatham Baroque.

### **Sound Engineer, Aliquippa Documentary** – *Jun.–Aug. 2018*

I worked as a sound engineer for a currently untitled documentary about the city of Aliquippa outside of Pittsburgh, PA. The film is directed by Megan Ruffe, Associate Producer at Florentine Films, based in New York City.

### **Personal Contractor in Sound Recording, Editing, and Mastering** – *2016–Present*

I maintain my own studio and provide recording, editing, and mastering services to clients. My clients typically include students from different music schools in Pittsburgh, in addition to local bands and artists.

## Service & Extra Curricular Activities

### **Pulcinella String Quartet** – *2013–2015*

I founded, and performed violin and viola for the Pulcinella String Quartet in State College, PA. The quartet raised nearly \$4000.00 for charity to help educate women and children in developing countries.

### **Game Creation Society, Carnegie Mellon University** – *2016–2019*

I was a member of the club and collaborated with many different students, participated in several game jams, and developed many games for fun.

### **Chess Club, Carnegie Mellon University** – *2014–2019*

I was a member of the Carnegie Mellon University chess team and we would compete in the Pittsburgh Chess League and in other large tournaments around the country.

### **NYC x Montreal, Cycling Tour** – *Jun. 2016*

My brother and I travelled 495 miles in 5 days of unsupported cycling. We cycled with our camping gear.

### **Washington D.C. x Pittsburgh, Cycling Tour** – *Jun. 2016*

My siblings and I travelled 360 miles in 4 days of unsupported cycling. We cycled with our camping gear.

### **Seattle x San Francisco, Cycling Tour** – *Jul.–Aug. 2019*

This summer my brother and I will do nearly 1000 miles of unsupported cycling down the west coast of the United States. We will be collecting donations for charity.

## Large-Scale Musical Performances

### **Matchmaker, Carnegie Mellon University School of Drama – Oct.–Nov. 2017**

I acted and performed solo violin as the Gypsy Violinist in Thornton Wilder's *The Matchmaker*, directed by the esteemed actor and professor, Anthony McKay. My role as Gypsy Violinist was positively praised by several press reviews, including the *Pittsburgh Gazette* and the *Pittsburgh City Paper*. The play's most famous adaptation is the renowned musical *Hello Dolly*.

### **Subsurface, Carnegie Mellon University Exploded Ensemble – Dec. 2017**

Subsurface is an experimental music festival which was held in Brady's Bend, a limestone mine outside of Pittsburgh known as one of the largest underground spaces in the United States. I debuted several installations and performed original music as a violinist, pianist, and guitarist.

### **Subsurface 2.0, Carnegie Mellon University Exploded Ensemble – Dec. 2018**

Subsurface 2.0 is the second version of the subsurface music festival that was held in a limestone mine. I installed several light installations and performed original music as a violinist and pianist.

### **Snoozefest, Carnegie Mellon University Exploded Ensemble – Apr. 2018**

Snoozefest is an overnight ambient electronic music concert. I performed two 30-minute-long sets featuring original music for violin, cello, synthesizer, and piano.

## References

### **Riccardo Schulz – [riccardo@cmu.edu](mailto:riccardo@cmu.edu)**

CEO of Pittsburgh Digital Recording & Editing Company and Professor of Sound Recording, Editing & Mastering, and Multitrack Recording at Carnegie Mellon University.

### **Jesse Schell – [jesse@schellgames.com](mailto:jesse@schellgames.com)**

CEO of Schell Games and Distinguished Professor of the Practice of Entertainment Technology at Carnegie Mellon University.

### **Thomas Castner – [thomas@allevi3d.com](mailto:thomas@allevi3d.com)**

Director of Hardware at Allevi and Associate Lecturer at University of Pennsylvania.

### **Thomas Corbett – [tcorbett@andrew.cmu.edu](mailto:tcorbett@andrew.cmu.edu)**

Instructor of Game Design and Prototyping at Carnegie Mellon University.

### **Jesse Stiles – [jessestiles@gmail.com](mailto:jessestiles@gmail.com)**

Professor of Media Art at Carnegie Mellon University.