

# Jacob E. Snipes

MIX(PHYSICS, GRAPHICS, 0.5)

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## Education

### University of Pennsylvania School of Engineering and Applied Science

Philadelphia, PA

MASTER OF SCIENCE IN ENGINEERING, COMPUTER GRAPHICS & GAME TECHNOLOGY, 3.67 / 4.00 OVERALL

Exp. May 2019

- **Notable Coursework:** Interactive Computer Graphics, Physically-Based Animation

### University of Pennsylvania School of Engineering and Applied Science

Philadelphia, PA

BACHELOR OF SCIENCE IN ENGINEERING, MECHANICAL ENGINEERING & APPLIED MECHANICS, *Magna Cum Laude*, 3.70 / 4.00 OVERALL

May 2018

- **Minor:** Computer Science
- **Honors & Awards:** Dean's List 2015 - 2016, 2016 - 2017, 2017 - 2018; 2018 John Couloucoundis Prize
- **Notable Coursework:** Advanced Dynamics, Fluid Mechanics, Solid Mechanics, Mechanics of Materials, Heat & Mass Transfer, Thermodynamics, Linear Algebra, Ordinary & Partial Differential Equations, Vibrations of Mechanical Systems, Data Structures & Algorithms

## Skills & Interests

<b>Software</b>	Houdini, OpenGL, WebGL, Maya, Unity, Unreal, SolidWorks, AutoCAD, Qt, Git, MATLAB, Excel
<b>Programming Languages</b>	C++, GLSL, JavaScript, C#, Java, OCaml
<b>Foreign Languages</b>	French (Fluent), Japanese (Beginner)
<b>Interests</b>	Singing, Theatre, Trivia, Photography, Baking, Creative Writing, Video Games

## Experience

### University of Pennsylvania SIG Center for Computer Graphics

Philadelphia, PA

RESEARCH INTERN: PHYSICALLY-BASED ANIMATION

May 2018 - Aug. 2018

- Wrote physically-based wind simulator under Dr. Chenfanfu Jiang to interface with Unity VR data visualization project
- Built in C++ and rendered with Houdini
- Features: Species concentration advection, mass diffusion, reverse-time solver, travel time calculation, velocity field visualization, data I/O

### Slothparadise

Remote

AR DEVELOPER - DUEL MONSTERS GO FOR HOLOLENS

Aug. 2017 - Dec. 2017

- Created JSON card database, allowing game to automatically check card stats (type, attribute, level, etc.) via C# scripting
- Added support for ydk files using C#, allowing players to easily create custom decks

### University of Pennsylvania

Philadelphia, PA

3D ANIMATOR

May 2017 - Aug. 2017

- Animated various real-world problems for use as teaching tools in Statics and Strength of Materials (MEAM 210) using Maya and SolidWorks
- Created videos in iMovie detailing 3D analysis of class's most difficult concepts using animation as a means of visualization
- Narrated videos, explaining the concepts to hundreds of students seeing them for the first time

## Projects

### LifeWatch

THE FIRST WEARABLE AUTO-INJECTOR (PATENT PENDING)

Sept. 2017 - Present

- Collaborated in team of six to design, test, and manufacture wearable auto-injector in watch-shaped profile
- Served as project manager, overseeing all areas of development: design, timeline, budget, external funding, and document editing
- Winner of First Prize at University of Pennsylvania's 2018 SEAS Senior Design Competition and 2018 M&T Summit
- Winner of Third Prize at 2018 BMEidea competition

### Smoke & Renders

PHYSICALLY-BASED EULERIAN FLUID SIMULATOR

May 2018

- Built in C++ and rendered with Houdini
- Features: Velocity/density/temperature advection, multiple source smoke generation, vorticity confinement, pressure projection

### Organic FEMistry

PHYSICALLY-BASED DEFORMABLE SOLID SIMULATOR USING THE FINITE ELEMENT METHOD

Mar. 2018

- Built in C++ and rendered with Houdini in team of four
- Notable features: Mesh tetrahedralization using TetGen, Neo-Hookean elasticity model, rigid-body collision detection, holonomic constraints
- Contributions: Hand calculations using Lagrange's equations, constraint implementation, collision handling, debugging, rendering