# Joseph Gao

*Software Engineer*

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## Education

2016–2018 **University of Pennsylvania**, *M.S.E in Computer Graphics*, 4.0 GPA, Philadelphia, PA.

2014–2018 **University of Pennsylvania**, *B.S.E in Computer Science*, 3.6 GPA, Philadelphia, PA.

- Expected Graduation: May 2018

**Relevant Classes**: Software Engineering and Design, Scalable and Cloud Computing, Computer Graphics, Algorithms, Programming for the Web, Computability and Complexity, Operating Systems, Computer Architecture.

**Technologies**: Java, Ruby, Python, JavaScript, C, C++, C#, Swift, HTML, CSS, Rails, Django, Meteor, Hadoop, Unity3D.

## Experience

2016-Present **Research Assistant**, *SIG Center for Computer Graphics at Penn*, Philadelphia, PA.
Crowd simulation and agent behavior modeling.

- Developed an ambient noise generation algorithm that reproduces a location's sound environment when fed a short audio sample. The algorithm is based off of a SIGGRAPH paper titled *Video Textures* by Schödl et al.
- Built the UI for a proprietary graphics testing environment in Unity, allowing researchers to alter a running test's parameters and have the environment dynamically respond without having to restart the test.
- Implemented a stochastic agent distribution system for a virtual market environment that enabled the accurate rendering of a randomly distributed homogeneous crowd adapting to predefined environment metrics and conditions.

2015-Present **Software Engineer**, *Penn Labs*, Philadelphia, PA.

- Lead developer for PennVolvement. Laid out the low-level specifications and led the backend development effort.
- Developed a recommendations module based off of Google's video adsorption white paper for PennVolvement.

2016-Present **Teaching Assistant**, *Computer Science Department at Penn*, Philadelphia, PA.

- CIS 121 - Data Structures and Algorithms.
- CIS 196 - Ruby on Rails Web Development.
- Developed course content with Java and Ruby, implemented grading tools with Capybara and RSpec.

2016-2016 **iOS Engineering Intern**, *Vea Fitness*, Philadelphia, PA.

- Increased user retention rate from 50% to 70% by implementing a streamlined user signup and login experience.
- Rewrote several core features in Swift by updating the UI and replacing deprecated components.

2015-2015 **Software Engineering Intern**, *3Top Inc.*, New York, NY.

- Developed a security module that removed posts containing malicious links and content with 95% accuracy.
- Refactored and expanded 3Top's API with Django's REST Framework to serialize and provide data in JSON.
- Improved the efficiency of post itemization by caching frequently ranked topics and their associated data.

## Projects and Awards

2016 **Surgery.io**, *Django and JavaScript*

- Enables surgeons to quickly check the compatibility between specific medical devices during a surgical operation.
- Doctors are able to simulate potential scenarios and save them with added annotations for future reference.
- Tentatively approved for use by the Hospital at the University of Pennsylvania.

2016 **Watchman**, *Rails and Swift*

- Apple Watch app that detects when a law enforcement agent fires a weapon or enters hand-to-hand combat.
- The app warns civilians within a one-mile radius to take shelter if a gunshot was detected.
- Also tracks an agent's heart rate in BPM and validates the data with the accelerometer to prevent false alarms.

2015 **TextFeed**, *Python and Twilio*

- Flask application that provides local crime alerts to users without an internet connection via SMS.
- Won Best Public Safety Hack and Best Use of Comcast Everyblock API at PennApps Winter 2015.

2015 **WikiLearn**, *Python*

- Visualization tool that ranks Wikipedia pages related to a central topic for educational purposes.
- Selected as a Top 16 Finalist at HackPrinceton Spring 2015.

2015 **PennVolvement**, *Rails and JavaScript*

- Connects students to local Philadelphia organizations and humanitarian events in need of volunteers.
- Named the official volunteer job portal for Penn students by the Penn Undergraduate Assembly.