

# Thomas Freehill

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<http://www.TomFreehill.com>

## Profile

Based in Decatur, GA, I have a bachelors in mechanical engineering with several years of professional lab experience. Nearly all of my personal projects are focused on AI, physics, and level design for video games. I have also extensively worked troubleshooting and providing hands-on training in multiple technology platforms.

## Employment History

**Solidia Technologies Inc.**, Piscataway NJ (5/2012 - 5/2014)

**Research and Development**, Production Technician

Planned and executed experiments to develop novel, potentially carbon negative cement technologies.

Assisted with information technology needs of the company.

- Improved quality of final products in a dynamic experimentation environment.
- Maintained constant information exchange with every team member for efficient production of meaningful results.
- Documented and presented lab experiment results at weekly team meetings.
- Extensive work with many industrial chemicals and MSDS, as well as constant 5S safety and housekeeping compliance.

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**Best Buy Geek Squad**, East Brunswick, NJ (3/2010 - 2/2012)

**Senior Counter Intelligence Agent**

Provided repairs and troubleshooting services to customers for personal and professional technology devices, ensuring repairs were complete beyond expectations, while keeping customers informed.

- Supervised and Trained new employees on sales, repairs, and running the precinct.
- Developed new tools for improved repair times and client satisfaction.
- Managed Inventory and consistently minimized overhead costs.

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**Best Buy Geek Squad**, Kingston, NY (5/2009 - 3/2010)

**Counter Operations Agent**

Sales and Service representative for personal and professional technology.

- Catalogued and completed extensive hardcopy and electronic paperwork for internal communications, customer communications as well as vendor communications.
- Responsible for completion of 10+ repairs for customers' personal technology on a daily basis.
- Provided customer service and conducted sales.

## Education

**New Jersey Institute of Technology**, Newark, NJ (2013 - 2016)

**Bachelor of Science**, Mechanical Engineering

**Cum Laude** GPA 3.56

**Top of the Class:** Kinematics of Machinery, Communication for Engineers, Dynamics of Spaceflight, Aerodynamics, Robotics & Programmable Logic Controllers, Game Mod Development

## Technical Experience

C/C++ (fluent)

Unity (proficient)

C# (proficient)

SDL 2 (fluent)

Java (familiar)

Solidworks (fluent)

Git (proficient)

Creo (fluent)

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## Independent Projects

### Halt Catch Fire (Windows and Android, 2017)

- 2D AI management game written in C# using Unity.
- Designed and programmed all gameplay, AI, and UI.
- Coordinated and led a team of seven (7) during a local month-long game jam.
- Documented daily scrum to track progress and maintain scope focus.
- Presented the game at local events, and improved the game through playtesters' feedback.
- Published the polished product on [freehill.itch.io](http://freehill.itch.io)

### Engine of Evil (Windows, 2016 - Present)

- Open source 2D Isometric game engine written in C++ using SDL 2.
- Optimized the rendering pipeline to increase frame rates beyond 200, even on low-end machines.
- Coded a sprite-sorting algorithm that allows thousands of animated sprites to be efficiently rendered across a near-unlimited number of draw layers, even with a scrolling camera.
- Programmed a fast any-angle pathfinding algorithm that reacts to both static and dynamic collisions while the entity moves toward its goal, and intelligently backtracks when needed.
- Designed a custom 2D animation file format and pipeline to quickly incorporate new art.

### Quake 2 Mod (2016)

- Open source executable and DLL modification written in C.
- Reworked the entire AI framework to allow the player to control any in-game monster.
- Programmed a new, dynamic, and responsive third-person camera.
- Extended HUD functionality to incorporate new inventory and control systems.
- Improved the engine-side sound management to account for an unlimited number of sounds.
- Implemented new user-experience friendly sounds and art to indicate added game functions.
- Delivered the complete project far ahead of schedule.

### Quake 4 Mod (2016)

- Open source executable and DLL modification written in C++ and IdTech 4's scripting language.
- Scripted and coded seven (7) new AI-centric weapon types, including a mana-based magic system.
- Designed and coded a PVS light-source ray casting algorithm to track player illumination and enemy awareness thereof.
- Scripted additional HUD elements for the player to track their new weapon types and light levels.

### Doom PWAD Level Design (2003 - 2008)

## Other Activities

### New Horizons, New Brunswick NJ (10/2010 - 1/2013)

#### Assistant Teacher

Educated children ages 5-13 in jujitsu martial arts; focused on autonomy, initiative, camaraderie, honor, and empathy.

- Educated classes from one on one to as large as ten (10).
- Communicated with parents, assistant teachers, and the head professor to achieve positive growth.