

# Minghui Liu

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<https://minghuiliu.com>  
<https://github.com/minghui-liu>

## EDUCATION

**Trinity College** 2013-2017  
B.S. in Computer Science Hartford, CT  
*summa cum laude* with distinction in Computer Science GPA 3.937

## EXPERIENCE

**Software Engineer** Fall 2017–Present  
*Altair Engineering* Sunnyvale, CA

- Design and implement new features for PBS Professional, a high-performance job scheduler for computing clusters, according to user requirements
- Improved the wall-clock time measurement algorithm and achieved better accuracy
- Redesigned the packaging scheme of PBS to offer more configuration options
- Introduced and created docker images to aid developers in developing and testing PBS features
- Project repo: <https://github.com/pbspro/pbspro>

**Software Engineer Intern** Summer 2016-Winter 2016  
*Vertafore* Windsor, CT

- Developed the backend and RESTful API for TLP, a file management web application
- Identified and mitigated security vulnerabilities in products through automated scanning and penetration testing

**Undergraduate Researcher** Spring 2014-Fall 2016  
*Trinity College HPC Research Group* Hartford, CT

Advisor: Prof. Peter A. Yoon

- Explored the feasibility of accelerating the image matching computation on GPUs
- Extracted features of images using openSURF and represented them using hypergraphs
- Parallelized the probabilistic hypergraph matching algorithm of Zass et al. (2008)'s using CUDA on an NVIDIA Tesla K20 GPU
- Achieved 8-20x speedup compared to baseline implementations on two Intel Xeon E5-2620 CPUs for images with 128 feature points or more
- Project repo: [https://github.com/minghui-liu/hypergraph\\_matching](https://github.com/minghui-liu/hypergraph_matching)

**Teaching Assistant** Spring 2014-Fall 2015  
*Trinity College Department of Computer Science* Hartford, CT

Courses:

CPSC-275 Intro to Computer Systems  
CPSC-215 Data Structures & Algorithms  
CPSC-110 World Wide Web

## CONFERENCE PRESENTATIONS

**Liu, M.**, Delaney, R., Yoon, P., Cheng, L. (2015). [Image Matching Using Hypergraphs on the GPU](#). *GPU Technology Conference, San Jose, CA*.

## PROJECTS

[TIN Webservice](#)

A multi-threaded web server that serves both static and dynamic contents. It has a one-thread-multiple-active-clients architecture implemented using a thread-pool and handles large number of concurrent requests.

**[J3DGE](#)** (senior project)

A Java 3D game engine. I also made a clone of Wolfenstein 3D using the engine to demonstrate its features.

**[Ray Tracer](#)**

An in-browser ray tracer implemented in JavaScript with tweakable objects, light sources, and recursion depth.

**[Python AES-256 Library](#)**

A Python implementation of the Rijndael cipher with 128-bit block size, 256-bit key size and three modes of operations: ECB, CBC, OFB.

For a comprehensive list of projects and more details, please see <https://minghuiliu.com/projects>

**HONORS AND AWARDS**

Phi Beta Kappa	2017
Dean's Scholar	2014
Faculty Honor	2013-2017
2 <sup>nd</sup> place in the ACM International Collegiate Programming Contest Northeast Regional	2015

**SKILLS**

C, Python, Golang, Java, shell script, MATLAB, Docker