# Yingtong Yu

Email: yingtongyujobs@gmail.com
Portfolio: JARVISHHH.github.io Github: https://github.com/JARVISHHH

## Education

**Brown University** **Sep. 2022 – May 2024 (Expected)**
*Master of Science in Computer Science - GPA: 4.0/4.0* *Providence, RI*
Courses taken: Advanced Computer Graphics, 3D/2D Game Engines

**Nankai University** **Sep. 2018 – May 2022**
*Bachelor of Engineering in Computer Science - GPA: 3.79/4.0* *Tianjin, China*

## Work Experience

**eBay** **Jun. 2023 – Aug. 2023 (Expected)**
*Software Development Engineer Intern* *San Jose, CA*

**ByteDance(TikTok)** **Apr. 2022 – Jul. 2022**
*Back-end Software Development Engineer Intern | Golang* *Beijing, China*

- Reduced the latency of the packing part of the Suggestion Middle Page **from 160ms to 10ms** by reducing the number of RPC calls and parallelizing different processes, and increased the speed by about **1500%**.
- Refactored an entire API service, making it more readable and extensible.
- Added metrics and AB test, built **Grafana** dashboards to visualize performance.
- Implemented Pinyin fuzzy search and supported the proximity-based filtering with **Elasticsearch**.
- Integrated the new version of the recommendation engine and provided more informative search bar options, such as property type of real estate, tips to switch cities, etc.

## Projects – Portfolio: JARVISHHH.github.io

**Ray Tracing and Path Tracing** | *C++* **Feb. 2023 - Present**

- Implemented traditional ray tracing and path tracing in C++, from reading scene data to outputting an image.
- Implemented basic features, like reflection, refraction, shadows and etc.
- Accelerated intersection calculation with bounding volume hierarchy(BVH) and k-dimensional tree(k-d tree).
- Implemented phong illumination model, implicit and explicit intersection, soft shadows under area lights, depth of field, texture mapping, super sampling and etc., for traditional ray tracing.
- Implemented four basic BRDFs (diffuse, glossy reflection, mirror reflection and refraction), Cook-Torrance microfacet model, importance sampling, stratified sampling and etc., for path tracing.

**Escape - A Game Produced by Self-made 3D Game Engine** | *C++* **Feb. 2023 - May. 2023**

- Designed and implemented a 3D game engine, and produced a dungeon escape rogue-like game using the engine.
- Implemented cylinder collision for dynamic game objects and Ellipsoid-Triangle collision for static game objects. Optimized collision checking with bounding volume hierarchy(BVH) and Hierarchical Grid.
- Implemented the A* algorithm based on the navmesh for pathfinding and behavior trees for decision-making.
- Implemented several graphics features based on OpenGL, like particle system, bump mapping, shadows, etc.
- Integrated a basic UI toolkit, including buttons, text and images.

**Stylized Caustics: Progressive Rendering of Animated Caustics** | *C++* **Apr. 2023 - May. 2023**

- Implemented the techniques introduced in the paper *Stylized Caustics: Progressive Rendering of Animated Caustics.*
- Designed and implemented the workflow framework, designed parameters for new input data and integrated new parameters into the existing scene file format for better readability and scalability.
- Projected generated photons from 3D space to 2D plane, and projected moved photons back to 3D space.
- Implemented greedy algorithm to assign photons to achieve minimal moving energy cost.

**Real-time Rendering Based on OpenGL** | *C++* **Nov. 2022 - Dec. 2022**

- Implemented a real-time rendering viewer based on OpenGL.
- Supported four basic shapes(cube, sphere, cone and cylinder) which can be tessellated on the CPU side, two types of lights(point lights and spotlights) in the scene and camera movement.
- Implemented per-pixel filter, kernel-based filter, texture mapping and adaptive level of detail based on the number of objects/distance from objects to camera.

## Technical Skills

**Languages**: C/C++, Java, Golang, Scala, Python, Shell, SQL
**Developer Tools**: VS Code, Visual Studio, Goland, IntelliJ, Anaconda, Virtual Box, Vim, Grafana, Qt Creator
**Technologies/Frameworks**: Linux, Git, Elasticsearch, Thrift, RPC, JavaFX, Flask, SQLite, OpenGL, Engine, GLM