WU ZEKAI

+65 98929329 • 2201764@sit.singaporetech.edu.sg • https://www.linkedin.com/in/zekai-wu-wzk/ • Nationality: Chinese

EDUCATION

Digipen Institute of Technology Singapore (SIT)   **Aug 2022 - Apr 2026**

- **Bachelor of Science in Computer Science in Interactive Media and Game Development**, GPA: 4.31/5.0
- Courses: Modern C++ Design Patterns, Data Structures, Algorithm Analysis, Machine Learning, High-Level Programming, Computer Environment, Linear Algebra & Geometry, Discrete Mathematics, Calculus & Analytics, Software Engineering Project, Operating System, Probability and Statistics

Temasek Polytechnic   **Apr 2019 - Feb 2022**

- **Diploma in Information Technology**, GPA: 3.25/4.0
- Courses: Data Analytics, Network Technology, Computational Thinking, Mobile App Development

WORK EXPERIENCE

Autonomous Vehicle Planning Engineer Intern, Venti Technologies   **Jan 2025 - Apr 2026**

- Developed and optimized behavior and motion planning algorithms for autonomous logistics vehicles using C++ and ROS2, focusing on decision-making and trajectory generation.
- Implemented, tested, and validated planning modules in ROS-based simulation pipelines and on real vehicles across 200+ scenarios.
- Improved planning efficiency by 20–30% through algorithm optimization, profiling, and parameter tuning.
- Integrated planning components with perception, localization, mapping and control via ROS topics, services, and TF, ensuring stable end-to-end autonomy.
- Analyzed large-scale simulation logs and vehicle data to identify edge cases and improve safety and system robustness.

Teaching Assistant, Digipen Institute of Technology Singapore   **Aug 2023 - Apr 2024**

- Guided students through challenging concepts and enhanced their programming abilities.
- Conducted lab sessions for upwards of 200 students
  - Assistant Teaching Modules: Linear Algebra & Geometry │ Game Implementation Techniques │ High-level Programming 2 │ Calculus and Analytic Geometry 1 │ Software Engineering Project 2

Full-Stack Web Developer, AiDA Technologies Pte Ltd   **Apr 2021 - Oct 2021**

- Designed the webpage's UI and visualization through AdobeXD, developed with ReactJS (frontend) and Springboot (backend), queried data using Microsoft SQL Server

ACADEMIC PROJECTS

Invenio Engine │ C++, C#, Git, Physx   **Sep 2024 - Apr 2025**

Invenio Engine is a custom-built 3D game engine developed for "Tarot's Fate".

- Led the full lifecycle of the physics system, from architecture design to implementation, using NVIDIA PhysX as the core physics backend. Engineered a C++ physics layer and exposed functionality to the C# gameplay layer through internal/native calls, enabling efficient cross-language communication. Implemented rigid body dynamics, collider components, and physics-driven gameplay interactions, supporting 1,000+ concurrent physics objects with stable performance. Leveraged PhysX's optimized solvers and collision pipelines to achieve accurate, scalable, and maintainable 3D physics simulation.

Insight Engine │ C++, C, Git, ECS   **Sep 2023 - Apr 2024**

Insight Engine is a custom-built game engine for our debut 2D game "Fragments".

- Led the design of the custom 2D physics system for dynamic gameplay. Engineered RigidBody and Collider components, supporting Box and Circle shapes and Static, Dynamic, and Kinematic body types. Optimized performance with an Implicit Grid for broad-phase detection, increasing supported physics objects from 60 to 600 at 60 FPS.

SKILLS AND REWARDS

- **Technical Skills:**
  - **Programming Language:** C++, C#, C, Java, JavaScript, Python, TypeScript, HTML/CSS, SQL
  - **Middleware/Frameworks:** ROS2, NVIDIA Physx, React, Ionic, Angular, Vue, Springboot
  - **Tools:** Git, Unity, Android Studio, MySQL, MongoDB, postman, Figma, Adobe XD
- **Languages:** English, Chinese
- **Awards/Activities:** 2024 CoDE Hackathon Runner-Up