

Karthik Iyer

979-344-8646 | kiyer@tamu.edu | [linkedin.com/in/karthikriyer2](https://www.linkedin.com/in/karthikriyer2) | github.com/KarthikRIyer

EDUCATION

Texas A&M University

Master of Science in Computer Science GPA: 4.0

College Station, TX

Aug. 2023 – Exp. May 2025

Indian Institute of Technology, Roorkee

Bachelor of Technology in Chemical Engineering, Minor in Computer Science GPA: 3.56

Roorkee, Uttarakhand, India

Aug. 2017 – July 2021

TECHNICAL SKILLS

Languages: C/C++, Java, Python, Groovy, HTML, CSS, JavaScript, Swift

Databases: Oracle, Apache Cassandra, PostgreSQL, Redis, Firebase Realtime Database

Frameworks/Libraries: OpenGL, glm, Eigen, Intel TBB, matplotlib, VTK, OpenTimelineIO, PySide2, assimp, SpringBoot, Flask

Software/Tools: CMake, Git, Blender, Apache Kafka, Adobe Premiere Pro, Adobe After Effects, Docker, Jenkins, Liquibase, Gradle, Maven, Linux, GitHub Actions

EXPERIENCE

Zscaler

Software Engineering Intern

San Jose, CA

May 2024 – Aug 2024

- Built a **production-ready CI/CD pipeline** with **Jenkins** for deploying containerized apps to **AWS ECS**
- Minimized regression impact using quality gates, **unit testing (JUnit)**, and **coverage analysis (JaCoCo)**
- Externalized app configuration with **Spring Cloud Config Server** and **Amazon S3** as the backing store
- Automated database deployment and improved schema maintenance using **Liquibase** for **DevOps**
- Assessed cloud deployment feasibility by building PoCs for **Kubernetes**, **Redis**, **Zipkin** and **Prometheus**
- Designed a **scalable, high-availability architecture** with **GDPR compliance** and a **1-second SLA** for **REST APIs**, in collaboration with the Principal Architect and engineers
- Set up a staging environment and troubleshoot connectivity, VPC peering, and deployment issues in AWS ECS

JPMorgan Chase & Co.

Software Engineer

Mumbai, Maharashtra India

Jul 2021 - July 2023

- Developed **SpringBoot microservices** serving the bank's liquidity platform and a 7B USD business - APAC deposits
- Developed a sophisticated solution to **improve resiliency** of the **Apache Cassandra** and **Apache Kafka** platforms within the bank's liquidity ecosystem and distributed it as a library
- Collaborated with 20+ feature teams to **support onboarding and adoption** of the **Cassandra resiliency solution**, leading to zero-downtime during a Cassandra Sustained-Resiliency event

Viga Entertainment Technology

Computer Graphics Engineering Intern

Remote

Jan 2021

- Performed **texture extraction** from polarized images and used **Vulkan** to map it to a 3D model
- Explored **3D reconstruction** from stereo images for a real-time film-making platform

Google Summer of Code — Academy Software Foundation

Student Developer

Remote

May 2020 – July 2020

- Implemented **C & Java bindings** for the **OTIO C++ library** thereby opening it up to more platforms
- Created a POC to auto-generate C bindings using **LLVM tooling**
- Wrote an **SVG adapter**, a **prototype for a subtitles schema** and **CI automation** with **GitHub Actions** and QEMU for multi-architecture builds

Google Summer of Code — TensorFlow

Student Developer

Remote

May 2019 – Aug 2019

- Developed a **cross-platform Data-Viz library** (SwiftPlot) in **Swift** with multiple rendering backends
- Added a **graphics output library** to **swift-jupyter** using pure Swift, to enable usage in **Google Colab** and **Jupyter Notebooks**
- Mentored pre-university students** through their first open source contributions to SwiftPlot, as a part of Google Code-In 2019

PROJECTS

- Granular Material Simulation with Position Based Dynamics** | Texas A&M University Nov 2024
- Implemented **simulation of granular material** based on the paper: Unified Particle Physics for Real-Time Applications by Miles Macklin, M.Müller, T.Y. Kim and N. Chentanez
 - **Parallelized constraint solving** using **oneTBB**
 - **Exported simulation data** to PLY files, and then to **Blender** to create high-quality visual results
- Directed Studies (Physically Based Simulation)** | Texas A&M University Jan 2024 - May 2024
- **Implemented simulation of gases** based on the paper: Unified Particle Physics for Real-Time Applications by Miles Macklin, M.Müller, T.Y. Kim and N. Chentanez with **Python** and **Taichi**
 - Explored potential improvements to fluid-object interaction to **support rough surfaces using vortex particles and vorticity confinement** under the guidance of Prof. Keyser
 - Conducted a **literature review** of developments in **position based dynamics simulations for fluids, elastic materials, granular materials and gas simulations**
- Food Ordering App** | Texas A&M University Aug 2023 – Dec 2023
- **Created a Food ordering application** with a **HTML/JavaScript** based UI and a **Java** and **MySQL** backend
 - Used the **microservices architecture** to improve maintainability according to separation of concerns
 - Developed a **REST controller framework** inspired by Spring MVC using **Java Reflection API**
 - Implemented **Service Discovery** inspired by Spring Cloud Eureka, using a **heartbeat based eviction strategy**
- Hair Simulation with Position Based Dynamics** | Personal Project Nov 2023
- **Implemented simulation of hair strands** based on the paper: Fast Simulation of Inextensible Hair and Fur by M.Müller, T.Y. Kim and N. Chentanez
 - Implemented **hair-hair interaction** using a **particle density voxel and density gradient** based approach
- RayTracer** | *C++*, *OpenImageDenoise*, *assimp* Sept 2019 – Sept 2020
- Implemented a **C++ PathTracer** based on **PBRT** and the **Raytacing in one weekend series**
 - Implemented **multithreading, tiled rendering, mesh loading** with **assimp** and **denoising** using **OpenImageDenoise**
- Undergraduate thesis - Simulation of granular material** | IIT Roorkee Aug 2020 – Apr 2021
- **Simulated mixing of prolate particles** of various sizes in a **vibrating packed bed** using **LIGGGHTS** and validated results against experimental data
 - Wrote a **C++ tool to process simulation VTK dump files** to calculate **shearing rate borrowing techniques from Smoothed Particle Hydrodynamics**
 - **Co-published a paper** titled '*Effect of non-sphericity of a narrow-sized binary mixture on mixing in convective vibrated packed bed using Discrete Element Method*' in Powder Technology

COURSES AND SKILLS LEARNED

- Computer Animation** | *Skinning, Blendshapes, Inverse Kinematics, Physical Simulation*
- Geometric Modeling** | *Affine Geometry, Spline Curves and Surfaces, Differential Geometry*
- Physically Based Modeling** | *Particle Systems, Numerical Integration, Rigid Body Simulation*
- Software Engineering** | *Software process models, Object Oriented Design, SQL and NoSQL Data Modeling*
- Distributed Systems and Cloud Computing** | *MapReduce, Synchronization, Consensus, Transactions, Concurrency*

ACCOMPLISHMENTS

- Fast-Track promotion to Software Engineer 2** | *JPMorgan Chase & Co.* Feb 2023
- Amongst top 3% globally in the new grad cohort
- Developer Story featured in the GitHub README project** | *GitHub* May 2022
- *Developer story* highlighting the journey from student, to open-source contributor, to a software engineer published as part of the GitHub README Project
- First Position in the AIST Real Steel Video Contest** Jan 2019
- Made an educational video highlighting the proces of steelmaking and new innovations in the field
 - Video link: *Steelmaking - New Age Innovations*
- Qualified for KVPY Fellowship** | *DST, Government of India* January 2017
- All India Rank 618 among 50,000 candidates