Sahil **Ramani**

Senior Software Engineer · 3D Simulation, Reconstruction & Synthetic Data

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Summary

Experienced graphics programmer and Machine Learning practitioner with 12+ years in the field, including 9 years in video games and 4+ years leading R&D teams. Specializing in the intersection of machine learning and real-time graphics, I focus on creating intuitive software that delivers high quality results. I'm driven to innovate and expand technological boundaries, eagerly embracing new challenges.

Skills

Game Engines	Unity3D, Unreal Engine, Godot, several proprietary engines
Graphics	HLSL, GLSL, DirectX, OpenGL
Programming Languages & Frameworks	C#, C, C++, Python, XAML, C++/Cli, Bash Scripting
Machine Learning	NeRF, Object Reconstruction, Gaussian Splatting, Convolutional Neural Networks, Neural Rendering
Version Control	Perforce, Git, SVN, Mercurial, Unity Version Control (Plastic SCM)

Work Experience

Zoox Inc
Foster City, CA

Senior Software Engineer, 3D Simulation, Reconstruction and Synthetic Data — *July 2023 - Present*

- Developed **3D Simulation and Synthetic Data** generation tools, boosting Zoox model performance by over 20%.
- Engineered frameworks for **dataset quality** evaluation using **ML and statistical approaches**, enhancing data integrity.
- Led projects to create realistic simulated worlds, employing state-of-the-art technologies like **NeRF, Gaussian Splatting**, and related techniques.

Unity Technologies
Seattle, WA, USA

Senior Software Engineer, Neural Rendering & ML Artistry / Software Engineering Manager, ML Lighting & Rendering — *Aug. 2019 - July 2023*

- Developed a Unity extension using **Neural Rendering** to dynamically transform game visuals, featured in the Beta teaser for the future of **Unity AI**.
- Significantly enhanced **machine learning efficiency** by designing **custom GPU kernels & operations**, which streamlined both training and inference processes, reducing overhead and accelerating performance.
- **Led a team of engineers** in pioneering research to leverage machine learning for superior game lighting and rendering.
- Implemented high-performance, **GPU-accelerated tile-stitching** for Unity's terrain system with zero latent allocations.
- **Patent 18/144,734** : System and Method for Interactive Asynchronous Tile-Based Terrain Generation

Crystal Dynamics
Redwood City, CA, USA

Engine Lead, Future Projects / Senior Software Engineer, Engine & Tools — *Nov 2014 - Aug 2019*

- Directed R&D efforts at Crystal Dynamics, **leading engine and tool technology advancements** for next-gen games.
- Engineered a groundbreaking **graph-based blendshape control system** from Maya to game, pivotal for Hulk's transformation in Marvel's Avengers.
- Dramatically increased editor and rendering performance, achieving over 20x and 2x improvements respectively within two years.
- **Patent #11189068** : Macro-based electronic map editing.

Dreamworks Dedicated Unit
Bengaluru, Karnataka, India

Software Applications Engineer, Animation & Rigging Tools — *Mar 2013 - Oct 2014*

- Contributed to the R&D team at DreamWorks Animation, developing award-winning **animation and rigging tools** used in over four animated films.
- Enhanced **cache handling and paging** designs, boosting editor performance by 25%.

Microsoft Corporation
Redmond, WA, USA

Software Development Engineer in Test, Xbox Graphics — *July 2011 - Oct 2012*

Nokia Research Center
Santa Monica, CA, USA

Research Intern, Mobile Experiences — *May 2010 - July 2010*

Yahoo! Software Development India
Bengaluru, Karnataka, India

Senior Systems Engineer / Systems Engineer — *July 2006 - July 2009*

Education

Masters of Science in Computer Science, Game Development
Los Angeles, CA, USA

University of Southern California — *Aug 2009 - May 2011*

Bachelor of Engineering, Computer Science
Bengaluru, Karnataka, India

BMS College of Engineering — *Aug 2002 - June 2006*