Sahil **Ramani**

Senior Software Engineer · Neural Rendering, 3D Reconstruction & Simulation

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Summary

Machine learning engineer and computer vision specialist with 15+ years of experience deploying production ML systems. Led development of neural rendering and terrain generation models at Unity Technologies, and architected 3D Reconstruction workflows for autonomous vehicles at Zoox. Proven track record leading targeted R&D teams of up to 5 engineers, with expertise in optimizing ML systems for real-time applications. Extensive background in graphics programming enables unique insights into developing high-performance ML solutions that maintain visual quality at scale.

Skills

Neural Rendering & Machine Learning	PyTorch, CUDA, computer vision, differentiable rendering, NeRF, Gaussian Splatting, 3D Reconstruction
Graphics Programming	DirectX 12, Vulkan, compute shaders, ray tracing, shader optimization
Game Engine Development	Unity (engine/editor dev, custom render pipelines), Unreal Engine, Godot
Languages & Development Tools	Python, C++, C#, Git, Perforce

Work Experience

Zoox Inc — *Foster City, CA*

Senior Software Engineer, 3D Reconstruction & Simulation — *July 2023 - Present*

- Led pioneering technical team implementing **NeRF and Gaussian Splatting**, significantly advancing training environment fidelity & diversity.
- Optimized **3D Simulation & Synthetic Data** pipelines delivering 20% improvement in Zoox ML model performance.
- Developed comprehensive simulation quality metrics using **FID, KL Divergence & SSIM** to quantify and reduce sim-to-real gap.

Unity Technologies — *Seattle, WA, USA*

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

- Led R&D efforts in **Neural Rendering** at Unity Technologies, developing AI-powered visual transformation technology featured in Muse/Sentis showcase.
- Engineered custom **GPU kernels** and ML operations that significantly improved training and inference performance through **optimized memory management** for Unity Sentis.
- Led a research team exploring **ML applications for augmenting game lighting and rendering systems**.
- 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*

- Led next-generation engine and tooling R&D initiatives at Crystal Dynamics, advancing core technology for AAA game development.
- Architected and implemented an innovative graph-based body animation morphing system for Marvel's Avengers, enabling seamless character transformations from Maya to runtime.
- 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.

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*