

Sudha Manigundam Raghavan

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SUMMARY

Design-informed Senior Software Engineer and prototyper who takes whiteboard ideas to software running on real devices. Ships and builds human-AI interaction experiences end-to-end. Extensive experience building for ambiguous interface with a focus on UX and Accessibility. Performance DRI across 30+ Apple first-party teams, with a horizontal-and-vertical view of Apple's stack. Developed and shipped for the Vision Pro platform from early hardware phase to current updated systems.

EXPERIENCE

Apple Inc. June 2019 – Present
Software Engineer → Senior Software Engineer, ICT2–ICT4 (VPG) Cupertino, CA

DRI Projects: App Launch Performance | Scrolling & Resizing | Spatial Gallery | HomeUI | Writing Tools | Measure | CARE Text Rendering | Freeform | 1st Party Apps Performance | App Store

- Designed and built a 0-to-1 native macOS app, Chronicle (SwiftUI) that drafts daily/weekly work updates from calendar, notes, Claude Code sessions, and radars via an on-device, privacy-first pipeline (Claude Code + MCP), and shipped it as an internal test build.
- Prototyped AI-driven applications end-to-end, including an AI-powered confluence search built on the Claude API to explore VPG Performance specific help.
- Designed and prototyped novel natural user input paradigms for visionOS using gaze, hand input, and Handwriting Recognition on the Logitech Muse Pen, from rough concept to working demo (Week of Code).
- Contributed to CoreAnimation–RealityKit framework design decisions for text rendering and NUI input latency by defining metrics and building plugins, informing platform direction for future visionOS experiences.
- Embedded with 30+ Apple product and framework teams annually as a cross-functional partner, developing a rare platform-wide understanding of Apple's technical constraints, product architecture, and system capabilities.
- Built and owned automated benchmarking and instrumentation apps across Interaction Latency, SwiftUI, and RealityKit, investing in the testing, tooling, and infrastructure that gives teams confidence to ship.
- Resolved 200+ build regressions per year across CPU, GPU, and memory domains spanning 30+ first-party teams, with individual fixes yielding 20–50% performance improvements.

Apple Inc. January 2025 – Present
Research Contributor – SPICE (VPG) Cupertino, CA

- Contributed to the design of user studies evaluating visionOS spatial computing experience quality across Presence, Immersion, Comfort, and Experience dimensions.
- Co-developed and validated novel questionnaires and measurement frameworks assessing user enjoyment and comfort across diverse visionOS content types; consulted on hardware prototype comfort studies with Product Design.
- Applied statistical analysis and visualization to privacy-restricted gaze-tracking data, communicating insights through clear data storytelling to inform product and design decisions.

Blue Sky Animation Studios (Disney) June 2018 – August 2018
AR/VR Intern Connecticut

- Prototyped Augmented Reality experiences for the Stereo/VR team using ARCore, Unreal Engine, and creative VR tools (Tiltbrush, Quill, Medium); worked on interaction design, material editing, particle effects, and AR design patterns.
- *Shipped:* Contributed to production of *Spies in Disguise* by Blue Sky Studios.

PAST PROJECTS

Ako — Virtual Assistant

Spring 2019

CMU, Producer / Designer

- Led design and production of an AR conversational NPC assistant on Oculus and Leap Motion combining speech processing (Amazon Polly) with spatial AR interaction, an early exploration of agentic, conversational UX. Managed a team of 4; designed the full production pipeline, UI, wireframes, dialog systems, and character personality.

TheatAR — Live AR Theater

Fall 2018

CMU, Lead Programmer

- Designed and implemented a real-time mixed reality live-performance experience on Microsoft HoloLens with an interdisciplinary team; explored occlusion, shared spatial experiences, lighting, and persistence, networking multiple devices for a simultaneous audience experience. Shows presented in the CMU Theater.

NeuroAct

Spring 2018

Ctrl-Labs (Meta Neural Band), Programmer / UX Tester

- Rapidly prototyped multiple experiences for a novel neural-interface EMG armband using Unity3D and Kinect; served as first external tester, collecting qualitative data and UX feedback that directly informed the shipped Meta Neural Band product.

Table Tennis VR Simulation

Spring 2017

Undergrad Research Thesis

- Designed and developed a VR simulation for Google Daydream using hand tracking from a mobile camera with OpenCV-based object tracking. Published a research paper on Natural User Interfaces in VR.

EDUCATION

Carnegie Mellon University

August 2017 – May 2019

Master of Entertainment Technology

Pittsburgh, PA

- **Coursework:** Building Virtual Worlds, Visual Story, Experimental Game Design, AI in Unreal Engine, Production and Leadership, Computer Graphics (OpenGL, Linear Algebra, 3D Math).

SSN College of Engineering, Anna University

June 2013 – May 2017

Bachelor of Engineering, Computer Science and Engineering

India

- **Coursework:** Data Structures and Algorithms, Operating Systems, Artificial Intelligence, Natural Language Processing, Computer Graphics.

SKILLS

Languages	Swift, SwiftUI, Objective-C, C, C++, Python, JavaScript, C#, Metal, SQL
Frameworks	RealityKit, UIKit, AppKit, ARKit, visionOS, CoreAnimation, Swift Package Manager
AI Tooling	Claude Code, Claude API, MCP (Radar, Confluence), prompt-driven development
Prototyping	Xcode, Unity, Unreal Engine
Design Tools	Sketch, Photoshop, Illustrator, Pixelmator Pro, Adobe Creative Suite
Tools	Xcode Instruments, Performance Profiler, Git, Perforce, Maya, Blender, Visual Studio
Areas	Interaction Design, AI-Driven Experiences, Human-AI Interaction, Multimodal Prototyping, HCI, Spatial Computing, AR/VR/XR, Natural User Interfaces, Cross-Functional Collaboration

CERTIFICATIONS

Human Centered Design, An Introduction — UC San Diego	January 2025
Advanced Quantitative Statistics with Excel	January 2025
Supervised Machine Learning: Regression and Classification — DeepLearning.AI / Stanford	May 2024
Game Development for Modern Platforms Character Design for Video Games Story and Narrative Development for Video Games	Spring 2016