# Nidhushan Kanagaraja | Technical Artist

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# **EDUCATION**

New York University | New York

Expected May 2025

M.Sc Computer Science (CGPA: 3.704) | Top 1% of class, Dean's List

Highlights: Game Design, Camera and Capture, Mixed Reality, Deep Learning

SRM University | Chennai, India

Jun 2018 – May 2022

B.Tech Computer Science (CGPA: 3.676) | Graduated with First Class Distinction, Dean's Research Scholar

Highlights: Data Structures, Cloud Computing, AI/ML Frameworks

#### **SKILLS**

Mixed Reality and Filmmaking: Unreal Engine, Unity, Gaea, Marvelous Designer, Maya, Niagara, Davinci Resolve, Perforce AI/ML & Deep Learning: Generative AI, LLMs, Transformers, Natural Language Processing, OpenCV, TensorFlow, Scikit Learn Programming Languages: Python, C/C++, Java, R, Shell Scripting, React.js, TypeScript, HTML, CSS, JavaScript Libraries/Frameworks: Universal Scene Description, Three.js, OpenVDB, Pandas, NumPy, Matplotlib, Django, SQL, Git

# PROFESSIONAL EXPERIENCE

NYU Game Innovation Lab - Graduate Research | New York

Jan 2024 - Present

**Publication** – <u>Moonshine: Distilling Game Content Generators into Steerable Generative Models</u> Multimodal AI/Deep Learning: Text-to-Map Procedural Dungeon Generation

- Developed a text-conditioned procedural content generation model using a synthetic dataset of 70,000 data points.
- Achieved 85% semantic alignment between generated maps and text descriptions by training two distinct models, the Five Dollar Model and the Diffusion Model, to establish a baseline for evaluating both the generated and synthetic content.
- Created a detailed synthetic map-description dataset with 49,000 training, 14,000 test, and 7,000 validation points.
- Evaluated models with metrics BLEU (54.7), ROUGE-L (33.2), METEOR (19.5), SPICE (11.3), and CLIP scores.
- Reduced data processing time by 30% through optimized map extraction processes and metadata analysis.
- Enhanced model accuracy by 15% using advanced heuristic calculations for precise metadata extraction and analysis.

# Giinius - Director of Artificial Intelligence | Manhattan, NY

May 2024 - Present

Finetuned Retrieval-Augmented Generation (RAG) Model for Educational Directory

- Developed a RAG-based chatbot that retrieves relevant resources before generating answers, improving response accuracy.
- Fine-tuned the model using LoRA and p-tuning on a dataset of 50,000 conversational pairs for efficient learning.
- Integrated dense passage retrieval (DPR) to enhance document retrieval and relevance in chatbot responses.
- Optimized retrieval and generation processes using NVIDIA NeMo, achieving a 15% improvement in task-specific queries.
- Enabled context-aware multi-turn dialogues, leveraging RAG to provide continuity and depth in user interactions.
- Reduced inference time by 30% using model optimization techniques like quantization, pruning, and knowledge distillation.
- Conducted A/B testing to improve chatbot accuracy, boosting user satisfaction and engagement.

# TCS (Citibank) - Software Engineer | Chennai, TN

Jul 2022 - Jun 2023

- Developed Citibank's big data frameworks, enhancing the Housekeeping, SFTP, and Outbound framework.
- Specialized in shell scripting and Python development, leading unit testing, component creation, and documentation.

# HighRadius - Software Engineer - Intern | Chennai, TN

Jun 2021 – May 2022

- Developed a delayed payments notification system, chatbot service and transaction risk evaluation ML frameworks.
- Developed prediction models to find delay in payments or risk of reaching the credit threshold with an accuracy of 92%.

# **PROJECTS**

# Mixed Reality Filmmaking: 30-Second Cinematic Short Film | CG Pro - Accredited by Unreal Engine

- Applied advanced procedural generation in Gaea, using PCG, scatter, and spline techniques to create dynamic landscapes.
- Managed previsualization with Sequencer, integrating camera rigs, VCam, and Take Recorder for efficient shot planning.
- Built custom characters in Metahuman, refining meshes and using facial mocap cleanup for lifelike expressions.
- Applied advanced worldbuilding techniques such as tessellation, triplanar mapping, displacement, and material collections.
- Enhanced environments using RVT, UV mapping, and photogrammetry to achieve highly detailed and realistic landscapes.
- Used Niagara FX for atmospheric effects such as heterogeneous volumes and complex particle simulations.
- Leveraged cinematic lighting with Lumen and PPV effects to enhance the scene's depth and mood.

#### Character Image Generation Pipeline using Diffusion Model | NVIDIA Learning Program

- Controlled character designs using context embeddings and CLIP, achieving an 85% match rate with text prompts.
- Conducted extensive testing and validation with a dataset of 10,000 images to ensure model robustness and accuracy.
- Developed a U-Net model for generating images of game characters from noise, enhancing visual outputs by 40% through the Denoising Diffusion process and techniques like attention mechanisms and residual connections.
- Improved image quality by comparing Denoising Diffusion Probabilistic Models (DDPMs) and Denoising Diffusion Implicit Models (DDIMs), creating a robust and efficient image generation pipeline.