AMARNATH MURUGAN

GRAPHICS PROGRAMMER | RESEARCHER

LINKS

Mail | Portfolio | LinkedIN | Github

EDUCATION

MS CS, Graphics & Viz Specilization
University of Utah
GPA: 4.0/4.0
2022 - 2024

B.Tech Computer Science & Engineering
SRM Institute of Science & Technology
89% Score | 50% Merit Scholarship
2015 - 2019

TECHNICAL SKILLS

PROGRAMMING

C | C++ | C# | Python | Julia | GLSL

SOFTWARES

Unity | Unreal | Substance Painter

LIBRARIES

OpenGL | CUDA | PyTorch | Skimage | OpenMP | MPI

SERVICE & TEACHING

Graduate Teaching Assistant | Univ Utah
08/2022 - 12/2022
TA for COMP1010 - Programming for all.

Volunteer | SIGGRAPH RCDC
Since 02/2021
Working towards establishing a
mentorship program for undergrads

Student Ambassador | Unity
11/2017 - 06/2019
Conducted events to democratize Game
development among students

AWARDS

Manhole | 3rd, Unreal Shorts Challenge
12/2021
Competed against renowned studios &
filmmakers and won $15,000 [Link]

Winner | Music Hack Day, Mumbai
12/2019
Won best music hack for building a
multi-user VR tool for music collaboration

Winner | Smart India Hackathon '17
04/2017
Won the World's largest Hackathon at
the time for an AR/VR museum app

COURSES

- CS6610 Interactive Computer Graphics
- CS6160 Computational Geometry
- CS6660 Physics-Based Animation
- CS6640 Image Processing
- CS6230 High Performance Computing
- CS6353 Deep Learning

WORK EXPERIENCE

Research Assistant | University of Utah   *Since 01/2023*
Conducting research on accelerating Tensor operations through
distributed computing and parallel execution in the GPU

Technical Director | Manhole Collective   *03/2020 - 01/2022*
Oversaw the creation of the real-time animated short-film 'Manhole',
which was funded by and created in Unreal Engine. The film was
screened at the prestigious *Annecy film festival* and 4 other fests

Research Assistant | IMXD Lab, IIT Bombay   *02/2019 - 01/2022*
Conducted research on narratives and novel interaction techniques
for VR & AR. Produced 8 publications in international conferences

Virtual Intern | Empathic Computing Lab   *05/2021 - 08/2021*
Worked on compute shaders in Unity for editing volumetric videos

Research Intern | IMXD Lab, IIT Bombay   *06/2018 - 07/2018*
Conducted research on passively interactive live-action VR films

Intern | Merkel Haptic Systems   *06/2017 - 07/2017*
Implemented medical training and visualization demos in AR & VR

Intern | XR Labs, Chennai   *12/2016 - 01/2017*
Created remote monitoring and product viz demos for Hololens

PROJECT HIGHLIGHTS

Graphics Programming   *Since 02/2020*
- Implementing an *OpenGL* renderer in *C++* that can read .obj files
  and render them using blinn shading. The render also supports
  environment mapping, reflections and shadow mapping.
- Implemeted Ridigbody dynamics in C++ with my custom renderer
- Wrote a raytracer from scratch in *C++* with support for dielectrics,
  non-uniform volumes, and Bounding Volume Hierarchy.
- Wrote interactive raymarched shaders that uses SDFs to render
  fractals and a volumetric animated 22 from Pixar's Soul [Shadertoy]

Deep PBR textures   *11/2022 - 12/2022*
- Implemented three modified versions of the ResNet architecture to
  regress a lit image to diffuse, normal & roughness maps

Manhole - Short Film   *03/2020 - 01/2022*
- Implemented an animated wet & grimy look for a character model
  through *shaders* based on a technique from 'Last of Us 2'
- Wrote a script to automate retargeting of an hour of mocap data
- Implemented buoyancy on an interactive fluid simulation plugin by
  sampling density & velocity buffers while smoothing aliasing issues

Cinévoqué   *06/2018 - 06/2019*
- Designed and implemented a system for live-action VR filmmaking,
  that can be used to create a passively responsive experience where
  the story evolves based on the user's gaze

PUBLICATION HIGHLIGHTS

- *Murugan, A.,* Vanukuru, R.,& Pillai, J. **Towards Avatars for Remote
  Communication Using Mobile Augmented Reality** | IEEEVR'21
- Sakhardande, P., *Murugan, A.*, & Pillai, J. S. **Exploring Effect of Different
  External Stimuli on Body Association in VR** | IEEEVR'20
- Pillai, J. S., *Murugan, A*., & Dev, A. **Cinévoqué: Design of a Passively
  Responsive Framework for Seamless Evolution of Experiences in
  Immersive Live Action Movies** | INTERACT'19

SPEAKING ENGAGEMENT HIGHLIGHTS

24 Hours of Chaos   *09/2021*
Spoke on the development process of the film 'Manhole'

Unite India   *12/2018*
Spoke on 'Interest driven Cinematic VR' at Unity's national conference