Curriculum Vitae

Vikas Thamizharasan

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Education

2020 - 2021 **Brown University**
Masters in Computer Science *(graduating Dec 2021)* *GPA: 4.0/4.0*

2014 - 2018 **International Institute of Information Technology - Hyderabad**
Bachelor Of Technology
Computer Science and Engineering *GPA: 8.29/10*

Work Experience

Sep 2020- ongoing **Teaching Assistant**, Brown University, USA
Course: Topics in 3D Computer Vision and Machine Learning, CSCI2952K

May 2020- ongoing **Graduate Research Assistant : Visual Computing Lab, Brown University**, USA
Advised by Prof. James Tompkin
Estimating 3D geometry and reflectance profile (diffuse, specular and subsurface scattering) of human faces along with scene illumination from a single image.
Advised by Prof. Daniel Ritchie
Learning texture and shape representations of 3D data to enable learning of probabilistic generative models for texture synthesis by sampling from a learned distribution.

Aug 2018- Apr 2019 **Research Intern : INRIA - Sophia Antipolis**, France
STARS Team in collaboration with Blu Manta (French Startup),
Advised by Dr.Antitza Dantcheva and Dr.François Brémond
Internship focused on (i) depth estimation and (ii) generating low-dimensional face embedding for face analysis using deep learning techniques from raw data acquired using state of the art structured light and active infrared hardware.

May 2017- Aug 2017 **Intern : Google Summer of Code**, Google
Mentored by Fabien and Souriya from Rainbow team, INRIA and hosted by Google
ViSP is a cross platform library built for visual tracking and visual servoing by Lagadic team from INRIA, France. The goal of this internship was to automate the creation of ViSP CAD model files from existing 3D formats and achieve perfect, loss-less conversion.
[Source Code and Wiki] **Qt, C++, Blender, Python**

Publications

2020 **Shape from Tracing**: *Towards Reconstructing 3D Object Geometry and SVBRDF Material from Images via Differentiable Path Tracing*, **3DV 2020**
Loudon Cohen, Purvi Goel, Brad Guesman, Vikas Thamizharasan, James Tompkin, Daniel Ritchie

Projects

2020 **Illumination-guided example-based stylization of 3D renderings**
GPU implementation of StyLit and EbSynth for CSCI 2240. Based on the paper "StyLit: illumination-guided example-based stylization of 3D renderings" by Jakub Fiser et al., SIGGRAPH '16.
[Source Code] [Video] [Presentation] **C++, CUDA**

2020 **Interactive Graphics Course, CSCI 2240**
Implemented Monte Carlo Path Tracer, Mesh operations like Subdivisions, Simplification and Remeshing and Animating deformable solid objects using the Finite Element Method in C++.
[Source Code] **C++**

2018 | **3D Object Reconstruction and Manipulation with a single image**
Advised by Dr.Vineet Gandhi, CVIT (Computer Vision Lab), IIIT-H
Inspired by 3-Sweep and Sketch-Based Modeling to reconstruct 3D models from a single image using geometric primitives to infer geosemantic constraints and model-to-image alignment using constrained optimization. The result was an interactive image editor where objects could be manipulated in 3D space with the advantage of applying non-rigid transformations along with texture mapping to create realistic re-rendering.
[Source Code] **PyQt, PyQt3D, OpenCV, AutoDiff**

2017 | **Virtual Garment Fitting from Single Image**
A single-shot single image-based approach for virtual cloth fitting, containing an unconstrained cloth parser and a cloth fitter. Cloth segmentation and parsing achieved using graph cut and nearest neighbor style retrieval (Yamaguchi et al. TPAMI'14). Extracting pose and feature points was achieved using OpenPose (Zhe et al. CVPR'17). Finally, cloth fitting was done by 2D mesh morphing and warping of the extracted clothing segments and feature points.
2017 Microsoft CFD winning project, All India finalist **JavaScript, Caffe, OpenCV, MATLAB**

2017 | **Search Engine for Wikipedia**
Created a search engine for Wikipedia (60GB dump) from scratch. Processed and tokenized large dump into inverted indexes. Two-pass multi-way merge sort to create single index(4GB). Used Cosine similarity with modified parameters for ranking. Project split into tasks and ran in parallel for fast retrieval and search. **Python**

2016 | **Typer Defence**
3D tower defence game built in Unity.
[Demo] **Unity game engine, C#**

Other Experience

2018 | **Volunteer**, IEEE International Conference on Image Processing, Applications and Systems.

2017 | **Head of Art Committee**, IIIT-Hyderabad.

2016 | **Teaching Assistant**, Sculpture, IIIT-Hyderabad.

Achievements

2017 Microsoft Code.Fun.Do Hackathon Winner Hyderabad.
2013 Top 5 in WHO Art competition.
2013 2400/2400 in SAT Subject Test.

Courses taken

- Interactive Computer Graphics
- Database Systems
- Computer Vision
- Statistical Mechanics in AI
- Artificial Intelligence
- Data Structures
- Advanced Deep Learning
- Software Engineering
- Distributed System
- Digital Image Processing
- Principles of Program. Lang.
- Computer Networks
- Differential Geometry
- Linear Algebra
- Info. Retrieval and Extraction
- Complexity and Advanced Algo.
- Digital Signal Analysis.
- Operating Systems

Technical skills

Languages	Python, C++, C, MATLAB, C#, Bash, Javascript, CUDA, Racket/Scheme.
Libraries	Pytorch, Tensorflow, OpenCV, Qt, OpenGL, Eigen, Windows Form App, RMI
Tools	Blender, Inkscape, LaTeX, GCP, Android Studios, Unity, Renderman.

Interests

(keywords)
Computer Vision, Computer Graphics, Deep Learning, Machine Learning, Evolutionary Robotics, Open Source, GANs, Self-supervised learning, Differentiable rendering, Neural Rendering, Image-based modelling, High-performance computing, AI for creative content, Demoscene, Game Engine, Full stack development
Art, Sculpting, Drumming, Cooking, Bouldering, Anthropology, Chess, Football, Formula 1, MMA