

# Curriculum Vitae

## Vikas THAMIZHARASAN

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### EDUCATION

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|-------------|--|--------------|
| 2020 - 2021 | <b>Brown University</b><br>Masters in Computer Science ( <i>graduating Dec 2021</i> )  | GPA: 4.0/4.0 |
| 2014 - 2018 | <b>International Institute of Information Technology - Hyderabad</b><br>Bachelor Of Technology<br>Computer Science and Engineering | GPA: 8.29/10 |
| 2012 - 2014 | <b>New Millennium School-DPS, Bahrain</b><br>Senior Secondary  |              |

### WORK EXPERIENCE

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|-----------------------|--|
| MAY 2020-<br>ONGOING  | <b>Graduate Research Assistant : Visual Computing Lab, Brown University, USA</b><br><i>Advised by Prof. James Tompkin</i><br>Estimating 3D geometry and reflectance profile (diffuse, specular and subsurface scattering) of human faces along with scene illumination from a single image.<br><i>Advised by Prof. Daniel Ritchie</i> <ul style="list-style-type: none"><li>• Learning texture and shape representations of 3d meshes for texture synthesis.</li><li>• Optimization of Redner (differentiable renderer) to solve the "shape from shading" problem for complex materials.</li></ul> |
| AUG 2018-<br>APR 2019 | <b>Research Intern : INRIA - Sophia Antipolis, France</b><br><i>STARS Team in collaboration with Blu Manta (French Startup),</i><br><i>Advised by Dr.Antitza Dantcheva and Dr.François Brémond</i><br>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-<br>AUG 2017 | <b>Intern : Google Summer of Code, Google</b><br><i>Mentored by Fabien and Souriya from Rainbow team, INRIA and hosted by Google</i><br><b>ViSP</b> 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.<br><a href="#">[ Source Code and Wiki ]</a> Qt, C++, Blender, Python  |

### PROJECTS

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|------|---|
| 2020 | <b>Illumination-guided example-based stylization of 3D renderings</b><br>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.<br><a href="#">[ Source Code ]</a> <a href="#">[ Video ]</a> <a href="#">[ Presentation ]</a> C++, CUDA   |
| 2020 | <b>Interactive Graphics Course, CSCI 2240</b><br>Implemented Monte Carlo Path Tracer, Mesh operations like Subdivisions, Simplification and Remeshing and Animating deformable solid objects using the Finite Element Method in C++.<br><a href="#">[ Source Code ]</a> C++   |
| 2018 | <b>3D Object Reconstruction and Manipulation with a single image</b><br><i>Advised by Dr.Vineet Gandhi, CVIT (Computer Vision Lab), IIIT-H</i><br>Inspired by <a href="#">3-Sweep</a> and <a href="#">Sketch-Based Modeling</a> 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.<br><a href="#">[ Source Code ]</a> 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 | **Typet Defence**  
3D tower defence game built in Unity.  
[\[ Demo \]](#)    Unity game engine, C#

## OTHER EXPERIENCE

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- 2020 | **Teaching Assistant**, Topics in 3D Computer Vision and Machine Learning, Brown University.
- 2018 | **Volunteer**, IEEE International Conference on Image Processing, Applications and Systems.
- 2017 | **Head of Art Committee**, IIIT-Hyderabad.
- 2016 | **Teaching Assistant**, IIIT-Hyderabad.

## ACHIEVEMENTS

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

## COURSES TAKEN

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- 2020    • Interactive Computer Graphics • Advanced Deep Learning • Differential Geometry.
- 2018    • Database Systems • Software Engineering • Linear Algebra.
- 2017    • Information Retrieval and Extraction • Distributed System  
• Statistical Mechanics in AI (Machine Learning) • Computer Vision.
- 2016    • Digital Image Processing • Complexity and Advanced Algorithms • Computer Graphics  
• Artificial Intelligence • Principles of Programming Languages • Digital Signal Analysis.
- 2015    • Data Structures • Computer Networks • Operating Systems

## TECHNICAL SKILLS

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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

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(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, Boulderling, Anthropology, Chess, Football, Formula 1, MMA