

REVANTH REDDY NALLA

CVIT, KCIS, IIIT Hyderabad,
Gachibowli, Hyderabad - 500032
(+91) 99630-99220
revanth.nr@gmail.com
<http://revanth.in>

RESEARCH INTERESTS

I am passionate about applying scientific research for real-world applications. My research interests are in the fields of computer graphics, human visual perception and human-computer interactive technologies. My previous research experiences include immersive displays, realtime rendering of massive textured models and natural interaction with VR worlds. My current research focuses on ambient light and sound systems for immersive experiences.

EDUCATION

Ph.D., Computer Science **Expected 2018**
Centre for Visual Information Technology, KCIS, IIIT Hyderabad
Thesis: Immersive Experiences of Massive Virtual Environments

B.Tech, Computer Science and Engineering **2004 - 2008**
IIIT Hyderabad

SKILLS

Programming Languages: C, C++, C#, MATLAB, CUDA, Arduino
Scripting Languages: Shell, Python
Graphics Development: OpenGL, GLSL, OpenSceneGraph, 3ds Max, Maya, Adobe Photoshop, Unity, Adobe After Effects
Web Technologies: HTML5, CSS, JavaScript, PHP, JQuery, MySQL
Softwares/APIs: MPI, OpenMP, Qt, Lex, YACC

RESEARCH EXPERIENCE

Ambient Lightscapes

Dr. P J Narayanan & Dr. Anoop M N, IIIT Hyderabad **2016 till date**

Designed and developed an augmented reality display system to provide an immersive movie watching experience without any head gear. The system expands the field of view by extrapolating the video to augment the contents of the scene on the viewers' surroundings covering the peripheral vision.

Technologies/Tools: C++, Matlab, SLAM, OpenCV, GLSL, Arduino programming

Distributed Massive Model Rendering

Dr. P J Narayanan, IDH, IIIT Hyderabad **2010 - 2015**

Designed and developed a distributed rendering system for realtime rendering of massive textured models on a cluster of multi-GPU machines. The rendering system follows a master-slave framework and is scalable to handle models of complexity ranging to billions of triangles and gigapixels of textures. The system also includes a distributed storage module to store the massive models and cater efficiently to the rendering cluster. The system has been developed as part of the *Indian Digital Heritage* project.

Technologies/Tools: C++, OSG, GLSL, MPI, OpenMP, CUDA

Stellarium on Liquid Galaxy

End Point Corp., Google Summer of Code (GSoC) **Summer 2015**

Stellarium is an open source planetarium software. Liquid Galaxy is an immersive panoramic multi-display system. Implemented support for Liquid Galaxy on Stellarium using Interactive Spaces.

Technologies/Tools: Java, C++, Qt, ZeroMQ, Interactive Spaces

The Omnipotent - Natural Interaction with Virtual Environments***IIIT Hyderabad******Sep 2014 - Feb 2015***

Developed an interface for interacting with virtual environments through hand gestures, voice recognition, facial tracking and expressions using an Intel® RealSense™ camera. Coordinated the team through the design of the game, *The Omnipotent*, which demonstrates the natural interface. The game allows the player to take the role of God interacting with the virtual world through completely natural interaction. The game won the top 250 award internationally in the Intel® RealSense™ App Challenge 2014.

Technologies/Tools: C#, Unity, Intel® RealSense™ SDK***Team Size: 6******Rendering Voxel Data on Stereoscopic Tiled Display of Hybrid CPU-GPU Cluster******ANURAG, DRDO******Apr 2013 - Dec 2013***

Designed a stereoscopic tiled display system on a hybrid cluster of multi-GPU machines. Guided a team through the software development for stereoscopic rendering of voxel data on the tiled display setup.

Technologies/Tools: C++, OSG, Qt***Team Size: 3******Computer Graphics Virtual Lab******Virtual Labs, MHRD, Govt. of India******Jun 2010 - Feb 2012***

Developed the *Computer Graphics Virtual Lab* which aims at teaching the basic concepts and algorithms of computer graphics visually through an interactive toolkit giving the user a hands on experience. A set of tutorials explain these concepts through step by step procedures allowing the users to visualise certain concepts like transformations, cameras and algorithms like frustum culling and rasterisation.

Technologies/Tools: Java, JOGL***Distributed Graphics Rendering******Dr. P J Narayanan, IIIT Hyderabad******Dec 2008 - Dec 2009***

Developed a *Distributed Graphics Rendering API* that runs on low end architectures with MPI communications as a part of the Rockwell Collins Aircraft Simulation program. Implemented the culling and rasterisation algorithms with support for basic 2D primitives and TTF fonts rasterisation.

Technologies/Tools: C, MPI, OpenGL***Garuda Tiled Display System******Dr. P J Narayanan, IIIT Hyderabad******Nov 2006 - May 2008***

Developed the networking module using multicast protocol for the Garuda tiled display wall system. Developed various applications for the Garuda system including an *Interactive 3D Molecular Visualiser*, an *Interactive Walkthrough of the 3D model of IIIT-H campus* and *FastWheels*, a 3D racing game with well-defined physics, controls and AI as part of the B.Tech. project.

Technologies/Tools: C++, OSG, 3ds Max, Qt***X Molecular Builder******Dr. P J Narayanan & Dr. Abhijit Mitra, IIIT Hyderabad*** ***Apr 2006 - Jul 2006***

Developed an application to create or load the 2D representations of molecules, re-construct their 3D structures and render these models using OpenGL. The Qt interface gives the user a complete control on orientation to study the molecular model and even design new molecules.

Technologies/Tools: C++, OpenGL, Qt

TEACHING EXPERIENCE	<p>Head Teaching Assistant Computer Graphics Distributed Systems Compilers</p> <p>Teaching Assistant Computer Graphics Compilers</p> <p>Mentor Linux Environment</p>	<p>IIIT Hyderabad Spring 2015, Spring 2016 Monsoon 2015, Spring 2017 Monsoon 2016</p> <p>IIIT Hyderabad Spring 2013 Monsoon 2007, Monsoon 2013</p> <p>Monsoon 2005</p>
PUBLICATIONS	<p>N. R. Revanth, P. J. Narayanan. 2015. "Large-scale Virtual Texturing on a Distributed Rendering System." In <i>Proceedings of the Fifth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG '15)</i>, Patna, India. 10.1109/NCVPRIPG.2015.7490050.</p> <p>N.R.Revath, P.J.Narayanan. 2012. "Distributed Massive Model Rendering" In <i>Proceedings of the Eighth Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP '12)</i>. ACM, NY, USA. Article 42</p>	
COURSE PROJECTS	<p>Aditi - The lost chapters <i>Kavitha Vemuri, Game Design & Engineering, IIIT-H</i> Monsoon 2014 Designed a turn-based strategy board game with an evolving board, gameplay and story arc based on players decisions every time it is played.</p> <p>Twiiiter <i>Cloud Computing, IIIT Hyderabad</i> Monsoon 2010 Implemented the functionalities of Twitter micro blogging site using NoSQL databases as part of Cloud Computing course project. <i>Technologies/Tools: HTML, PHP, Ajax, Hbase, MongoDB, Zookeeper, Thrift</i> <i>Team Size: 2</i></p> <p>Parallel MiniMax - AI for Chess <i>Dr. Kishore Kothapalli, Multicore Architecture, IIIT-H</i> Spring 2009 Developed a parallel MiniMax with alpha-beta pruning algorithm over GPGPU using CUDA. Designed a Chess game with AI based on the parallel algorithm. <i>Technologies/Tools: C++, CUDA, Qt, OpenGL</i> <i>Team Size: 2</i></p> <p>Video Google <i>Dr. C V Jawahar, Computer Vision, IIIT Hyderabad</i> Feb 2007 - Mar 2007 Coordinated with a team through the development of a video search engine which retrieves videos based on a part or whole of an image as query. <i>Technologies/Tools: C++, Python, OpenCV, MySQL, CGI, Javascript</i> <i>Team Size: 19</i></p> <p>Cross Language Information Retrieval <i>Dr. Vasudeva Varma, IEIR, IIIT Hyderabad</i> Monsoon 2007 Designed a <i>CLIR engine</i> from Telugu to English which retrieves relevant English documents based on a Telugu Query. <i>Technologies/Tools: Lucene, Java, Python</i> <i>Team Size: 3</i></p> <p>C-minus Compiler <i>Dr. R Govindarajulu, Compilers, IIIT Hyderabad</i> Monsoon 2006 Implemented a compiler for C-minus language, a subset of C language. <i>Technologies/Tools: Lex, YACC</i></p>	

Watermarking of Digital Media

Dr. Anoop M Namboodiri, DIP, IIIT Hyderabad

Monsoon 2006

Implemented several algorithms to watermark digital media like images, videos etc. to protect them from copyright infringements.

Technologies/Tools: C++

Team Size: 2

Snakes & Ladders - An online multiplayer game

Dr. Kamalakar Karlapalem, ITWS-2, IIIT Hyderabad

Nov 2005

Developed a 3D online multiplayer Snakes & Ladders game as part of ITWS-2 course. The game is built with Qt interface and OpenGL for rendering with a choice of single-player with AI or multiplayer over network with other players.

Technologies/Tools: C, Python, OpenGL, Qt

Team Size: 3

**ACADEMIC
ACHIEVEMENTS**

- Administered the GPU servers in CVIT, IIIT Hyderabad for 7 years.
- Exhibited *Ambient Lightscapes System* at R&D Showcase 2017, IIIT-H.
- Exhibited *The Omnipotent* game at the R&D Showcase 2016, IIIT-H.
- Presented a poster on “*Large-scale Virtual Texturing on a Distributed Rendering System*” in NCVPRIPG 2015 held at IIT Patna.
- Successfully completed *Stellarium on Liquid Galaxy* project in *Google Summer of Code 2015*.
- Achieved the *Top 250 Ideas award* for *The Omnipotent* game in the Intel® RealSense™ App Challenge 2014.
- Developed *CLAW*, a cloud project/dataset repository and centralised account management system for the GPU servers at CVIT.
- Presented a poster on “*Distributed Massive Model Rendering*” in ICVGIP 2012 held at IIT Mumbai.
- Demonstrated the *Distributed Massive Model Rendering System* and the *Computer Graphics Virtual Lab* in R&D Showcase 2012, IIIT Hyderabad.
- Demonstrated the *Video Google engine* in R&D Showcase 2007, IIIT-H.
- Exhibited the *Garuda Tiled Display Wall System* and its applications at R&D Showcase 2007, IIIT Hyderabad.
- Demonstrated the *Snakes & Ladders multiplayer game* in R&D Showcase 2006, IIIT Hyderabad.

**EXTRA-
CURRICULAR
ACTIVITIES**

- Second prize winner of *DOTA Challenge* in *Zombie Zone '09* gaming arena held as a part of our annual college fest, *Felicity '09*.
- Designed the stage backdrop and promotional posters as a member of the design team for our annual college fest, *Felicity* in 2007 and 2008.
- Designed an *Animated Promotion Video* for our annual college fest, *Felicity '07* using *3ds Max, Blender and iMovie*.
- Revitalised & organised *Cache-in*, an online treasure hunt game with interactive story telling & puzzles as part of our tech fest, *Threads '07*.
- Winner of *Sculpt*, a 3d game design contest of *Felicity '06* for designing a Real Time Strategy Game.
- Exhibited my art in the *fine arts exhibition '07* held at IIIT Hyderabad.
- Winner of *The Hindu Young World painting competition*.
- Awarded a Medal for achieving 3rd rank in the *Global Mathematical Talent Probe 1999* conducted by the Institute for Scholastic Evaluation (IFSE) Global Inc.