Curriculum Vitae of P. J. Narayanan

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Education

Ph.D. in Computer Science, University of Maryland, College Park, USA – 1992

M.S. in Computer Science, University of Maryland, College Park, USA – 1989.

B.Tech (Hons.) in Computer Science and Engineering, IIT, Kharagpur, India – 1984.

Positions Held

Director – From 2013
Associate Professor – From 2000. *Professor* – From 2004
Dean (Research & Development) – 2006 to 2013
Head, Centre for Visual Information Technology – 2000 to 2013
International Institute of Information Technology, Hyderabad.

Visiting Scientist – May 2003 to July 2003
Computer Vision Group, Microsoft Research, Redmond

Scientist D, E and Head of Computer Vision & Virtual Reality – 1996 to 2000
Centre for Artificial Intelligence & Robotics, DRDO, Bangalore.

Research Faculty Member – 1992 to 1996
Robotics Institute, Carnegie Mellon University, Pittsburgh.

Graduate Assistant – 1986 to 1992
Department of Computer Science, University of Maryland.

Associate Development Engineer – 1984 to 1986
CMC R&D, Secunderabad, India.

Research Areas

Computer Vision, Computer Graphics, Parallel Computing

Professional Service

Program Chair:
- Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP). 2010.
- Asian Conference on Computer Vision. 2006.

Area Chair or Senior Program Committee Member:
- International Conference on Computer Vision (ICCV). 2011, 2007.
- Asian Conference on Computer Vision (ACCV). 2010, 2009, 2007.
- International Joint Conference on Artificial Intelligence (IJCAI), 2007.

Associate Editor:
- Journal of Parallel and Distributed Computing (JPDC). June 2012 onwards.
- IPSJ Transactions on Computer Vision and Applications. 2007 to 2011.

Main/Co Organizer:
- HiPC Workshop on Hybrid and Multicore Computing. 2010, 2011.
- Mysore Park Workshop on Computer Vision. 2011.
- IUPRAI Summer School and Recognition and Retrieval. 2011.
- DAGM Tutorial on Computer Vision on the GPU. 2010.
- CVPR Course on Computer Vision on the GPU. 2009.
- ACM PPoPP Tutorial on GPU Architecture, Programming and Performance Models. 2010.
- Indo-Israeli Workshop on Computer Vision. 2008.

General Chair:
– Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP). 2000.

Papers Committee Member:
– High Performance Graphics (HPG). 2013, 2011.
– Symposium on Interactive 3D Graphics and Games (I3D). 2013.
– Computer Graphics International (CGI). 2012.
– IEEE Virtual Reality (VR). 2011.

Journal Reviewer:
– International Journal on Computer Vision (IJCV).
– IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI).
– IEEE Journal of Mathematical Imaging and Vision.
– IEEE Transactions on Circuits and Systems for Video Technology (CSVT).
– IEEE Transactions on Visualization and Computer Graphics (TVCG).
– IEEE Transactions on Parallel and Distributed Systems (TPDS).
– IEEE Transactions on Very Large Scale Integration (TVLSI).
– Journal of Parallel and Distributed Computing (JPDC).
– The Visual Computer (TVC).

Program Committee Member or Reviewer:
– ICCV 2005, 2009; CVPR 2008, 2009, 2010, 2011; ECCV 2004, 2006, 2008, 2010.
– ICPR 2008, 2010, 2012; ICVGIP 2000-2012; WACV 2006.
– Eurographics 2011; EuroVis 2009; ACM Multimedia Modelling 2008.
– SIGGRAPH Asia/ACM ToG. 2009, 2011.
– HiPC 2004, 2008; LCA-GPGPU 2010.

Board membership:
– Safal Solutions Pvt Ltd, a company developing automation tools for the social sector.
– Saral Services, an NGO works on application of IT for the rural sector.

ACM and ACM India:
– Co-Chair, ACM India Council. 2009-2012.
– President, ACM India. 2012-2014.
– Member, Heidelberg Forum Committee. 2013.

National Committees:
– Steering Committee, NRDMS, Department of Science and Technology. 2013 onwards
– Working Group of TDIL, Ministry of Communication & Information Technology. 2010-2012
– Project Advisory & Monitoring Committee, Department of Science and Technology. 2008-2011.
– NMITLI Project Monitoring Committee, CSIR. 2008 onwards.
– Euro-India SPIRIT Working Group. 2010-2012.
– Faculty Selection Committees.
IISc Bangalore, IIT Bombay, IIT Delhi/Ropar, IIT Patna, NIT Calicut.

Awards and Honours

– ACM Presidential Award. 2013.
– Best paper. Eurographics Symposium on Parallel Graphics and Visualization. 2010.
– CUDA Fellow in recognition of contributions to GPGPU by Nvidia Corporation. 2008
– Best applications paper. International Conference on Multisensor Fusion and Integration. 1996.
– Captain, University of Maryland programming team. Honourable mention in the world finals. 1989.
– Fifth rank in the state of Kerala in secondary school board examinations. 1978.

Plenary/Invited Talks

– Compute 2013. Sixth ACM India Computing Convention, VIT Vellore. India. August 2013.

– NCSOFT 2013. Third National Conference on Software Engineering. Cochin University. August 2013.

– International Workshop on Computer Vision and Machine Learning. SSIHL, India. December 2012.

– Workshop on High Performance Computing. ANURAG, DRDO, Hyderabad. September 2012.

– Indo-US Workshop on System Architectures. August 2012.

– Workshop on Haptics and Virtual Reality in Robotics Applications. IIT Delhi. July 2011.

– Graphics Technology Summit. Intel Bangalore. September 2010.

– Symposium on Issues in the Design of Complex Multi-Core Systems. Bangalore. October 2010.

– Homi Bhabha Birth Centenary Workshop on Introduction to Graph and Geometric Algorithms. Indian Institute of Science, Bangalore. July 2009.

– General Electric John Welch Technology Centre. October 2005.

– Tech Fest APOGEE Invited Lecture. BITS Pilani. March 2004.

– Tech Fest Lecture. IIT Kharagpur. March 2001.

– N Rama Rao Distinguished Lecture. IIT Kanpur. April 2000.

– Science Day Lecture. CVRDE, DRDO, Chennai. February 2000.

Thesis Students

Doctoral Students:

– Pawan Harish, 2013. (Post-Doc, UC Irvine. Samsung Research)
– Four more in the pipeline

Masters Students: (program with a strong thesis)

– Sujit Kuthirummal, 2003. (PhD, Columbia. Now at Google, NY)
– Soumyajit Deb, 2003. (MSR; DreamWorks)
– Sashi Kumar Penta, 2005. (Nvidia; Intel, Portland)
– Kiran Varanasi, 2005. (PhD, INRIA. Max Planck; Technicolor, France)
– Nirnimesh, 2006. (Google, Mountain View)
– Vardhman Jain, 2006. (Google, Mountain View)
– Jag Mohan Singh, 2008. (Intel; Samsung; Qualcomm Research, India)
– Pooja Verlani, 2008. (Rediff; Google, Mountain View)
– Shiben Bhattacharjee, 2009. (Adobe; DreamWorks)
– Suryakant Patidar, 2009. (Nvidia, India)
– Prachi Agrawal, 2010. (ZS, Pune; Intel, Bangalore; LinkedIn, CA)
– Naveen Bolla, 2010. (Qualcomm; DreamWorks)
– Vibhav Vineet, 2010. (PhD Student, Oxford-Brookes)
– Suhail Rehman, 2010. (CMU Qatar)
– Sashidhar Guntury, 2011. (PhD Student, Rutgers)
– Pavan Kumar Dasari, 2012. (Crypsis; Microsoft)
– Sidharth Choudhary, 2012. (PhD Student, Georgia Tech)
– Wasif Mohiuddin Khaja, 2012. (Kritikal; ADSC, Singapore)
– Rajvi Shah, 2012. (MPI; PhD Student, IIIT-H)
– Harshit Sureka, 2013. (NREC/CMU)
– Rohit Nigam, 2013. (Microsoft)
– Five more in the pipeline

Key Contributions to Research

My research contributions over the past 25 years have spanned three areas: Computer Vision, Computer Graphics, and Parallel Computing.

Computer Vision: My doctoral thesis focussed on efficiency using parallel platforms of the day for various problems related to Computer Vision. I developed *replicated data algorithms* to effectively utilize the massively parallel processors as the problem window sizes used then were smaller than the processor size. I have always been concerned with practical efficiency of all systems. I have picked up similar lines of work and have played a key role in adapting many operations of interest to Computer Vision on the GPU such as clustering, bundle adjustment, graph cuts, SVD, Neural Networks, etc.

I worked on *virtualized reality*, the first project that attempted to capture in 3D activities in large spaces. We setup a studio in 1995 with 51 cameras that observed an activity – like a dance – in a large space. This was converted to graphics-ready dynamic models which could be navigated from any viewpath by viewers at view time. This line of work was followed up in later years by several groups around the world. Capture of large spaces in 3D has advanced significantly in the subsequent 15 years. It is satisfying to see the progress in this area, right upto the appearance consumer grade sensors like Kinect. I am now engaged with efficient processing and exploitation of noisy 3D data obtained from unstructured collection of photographs of a large object like a monument.

I have also been working on enhancing or editing videos with specific intention. This includes preserving privacy of individuals through person de-identification in videos as well as event-based representation and editing of everyday videos.

Computer Graphics: I got into working on the intersection of computer vision and graphics in the form of image-based rendering as part of virtualized reality. I worked also on the adoption and application of virtual reality or simulation and visualization based techniques in the Indian strategic sector when working at CAIR. While the actual adoption is still not high, I was definitely able to bring to that sector an awareness on related matters.

We have worked on efficient and realistic ray tracing, especially using the graphics accelerators for a few years. This includes ray tracing highly complex implicit surfaces, fast tracing with advanced effects of deformable scene geometry with per-frame rebuilding of the representations, and advanced global illumination effects using ray tracing on parametric surfaces.

We have also worked on *computational displays*, specifically using computational methods to enhance off-the-shelf display systems. This includes increasing the pixel count economically by tiling displays, rendering accurately to arbitrary-shaped displays, enhancing apparent display levels to mimic true high dynamic range displays, etc.

Parallel Computing: Efficient computing on the practical parallel machines has been a topic of interest to me from by PhD days. I developed efficient implementations of common graph algorithms and filtering algorithms in addition to the Computer Vision work during my PhD.

Recently, we have been the forefront of the use of the Graphics Processor Unit (GPU) as an effective accelerator for several irregular problems for which they may not be seen as a natural platform. This includes in graph algorithms like BFS, SSSP, APSP, minimum spanning tree, connectivity and maxflow. We have also worked on list ranking ranking, range searches, clustering, convex hull, SVD, etc. I have been focussing on the acceleration using CPU and GPU cores of a system of problems with long sequential dependence such as error-diffusion dithering, bzip compression, etc. The representations we devised and our code have been used by several researchers in subsequent years,

Nvidia corporation declared me a **CUDA Fellow** in recognition of my contributions to general purpose computing on the GPU in 2008.

Key Contributions to Education/Research Community

My contributions to the computing education and research include the following.

ACM India and the Community: I have been associated with ACM India as the initial Co-Chair of the India Council from the very beginning in 2009. I was subsequently elected as the first President of ACM India in 2012. ACM India has primarily focussed on being relevant and needed by the larger computing community in India. As a result of our efforts, ACM has grown from 1 professional and 25 student chapters to 15 professional and 77 student chapters in India. Membership has doubled to over 6200 in the same period. Significant growth is seen in the number of conferences associated with ACM, the number of DSP events, etc. The recent growth of ACM's presence in India is quite brisk.

I am proud about some of the other initiatives that ACM India was able to achieve under my leadership. We established an *ACM India Doctoral Dissertation Award* to be given to the best dissertation from an India-based institution. We were able to convince TCS to sponsor it for the first 3 years too. The initial awards – a main award and an honourable mention – were given in January 2013, after an elaborate process of evaluation by a jury of truly eminent researchers from the world over. We have established an education board within ACM India to look at the grand challenge of educating a huge population. We have started to build a community of researchers and faculty members of computing in India through a *Faculty Summit* held in February 2013 along with Microsoft Research. The summit looked at the challenging task of increasing PhD output 10 fold to 1000 per year in 10 years. A report detailing the challenges and possible actions is now available and has been given to the academia as well as the policy makers. A survey of PhD production was also conducted in 2012-13 on behalf of ACM India, inspired by the Taulbee report, throwing up interesting facts. We are in the process of establishing a wide-based *Research Board* within ACM India to speak on behalf of the Computing Research Community in India. ACM-W has been active in India since 2011 and has been organizing regional celebrations and other events in different parts. ACM India and ACM-W India have been working with Anita Borg Institute to conduct the Grace Hopper Conference India annually from 2011. The number of DSP events in India in the past 12 months was 40; India may well have the most DSP events among all countries in the coming year.

I was awarded an **ACM Presidential Award** in 2013 in recognition of my services to promote ACM's missions in India.

IIIT, Hyderabad: The International Institute of Information Technology (IIIT), where I work, is not a typical academic institution. It has been set up as a research university with several innovations, such as, research-center as basic units (instead of discipline-specific departments), undergraduate research emphasis and a curriculum that facilitates it, autonomous research groups, etc. The institute in less than 15 years of existence has the largest research groups in several areas of computing and the most number of theses being pursued by students. IIIT-H is now recognized among the top 2-3 institutions in India including the IITs, purely based on its research strength and education impact. Our academic and administrative models are being replicated to 20 new IIITs that will be setup in India soon.

I have been with IIIT-H from its third year and have been responsible for the graduate and research programs from the very beginning, as the Graduate Program In-charge from the beginning and later as the Dean of Research. The journey has been one of experimentation, exhilaration, and learning. I am the Director (or President) of the institute from April 2013 and would like to make IIIT-H a noted institutions in the computing area in the world. In addition, my own group is the largest Visual Computing group by far in India and is emerging as a noted group in the world.

I have also been involved with a few national committees or efforts involving planning and monitoring research projects in the country. I have reviewed for and coordinated the review process of a few relevant journals. I have also been involved with the organization and program of Computer Vision, Graphics, and High Performance Computing conferences in India and outside. This includes being the Area Chair of International Conference on Computer Vision (ICCV) in 2007 and 2011, of the Asian Conference on Computer Vision (ACCV) in 2007, 2009, and 2010, and Senior PC member of IJCAI 2007.

Patents

A US patent on "Method for Creating Virtual Reality" (US 6084979). July 2000.

Selected Publications

Books and Chapters:

A. N. Rajagopalan and P. J. Narayanan, eds., *ICVGIP '10: Proceedings of the Seventh Indian Conference on Computer Vision, Graphics and Image Processing*, (New York, NY, USA), ACM, 2010.

P. J. Narayanan, S. K. Nayar, and H.-Y. Shum, eds., *Computer Vision - ACCV 2006, 7th Asian Conference on Computer Vision, Hyderabad, India, January 13-16, 2006, Proceedings, Part I & II*, vol. 3851 & 3852 of *Lecture Notes in Computer Science*, Springer, 2006.

C. V. Jawahar, J. Mukhopadhyaya, P. J. Narayanan, and R. Nevatia, eds., *Indian Conference on Computer Vision, Graphics, and Image Processing*, Allied Publishers, 2000.

P. Harish, P. J. Narayanan, V. Vineet, and S. Patidar, "Fast Minimum Spanning Tree Computation," in *GPU Computing Gems: Jade Edition* (W. mei W Hwu, ed.), ch. 7, pp. 77–88, Morgan Kaufmann, 2011.

P. J. Narayanan, V. Vineet, and T. Stich, "Fast Graph Cuts for Computer Vision," in *GPU Computing Gems: Emerald Edition* (W. mei W Hwu, ed.), ch. 29, pp. 439–450, Morgan Kaufmann, 2011.

N. V. Neeba, A. Namboodiri, C. V. Jawahar, and P. J. Narayanan, "Recognition of Malayalam Documents," in *Guide to OCR for Indic Scripts* (V. Govindaraju and S. Setlur, eds.), ch. 6, pp. 125–146, Springer, 2010.

L. S. Davis and P. J. Narayanan, "Massively Parallel Search for the Interpretation of Aerial Images," in *Massively Parallel Artificial Intelligence* (H. Kitano, ed.), ch. 3, pp. 38–34, 1993.

P. J. Narayanan and L. S. Davis, "Replicated Image Algorithms and Their Analyses on SIMD Machines," in *Parallel Image Processing* (A. Saoudi, M. Nivat, and P. S. P. Wang, eds.), pp. 335–352, World Scientific, 1992.

Journal Papers:

R. Shah and P. J. Narayanan, "Interactive video manipulation using scene background and object trajectories," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 23, no. 9, pp. 1565–1576, 2013.

P. Harish and P. Narayanan, "Designing perspectively-correct multiplanar displays," *IEEE Transactions on Visualization and Computer Graphics*, vol. 19, no. 3, 2013.

J. Soman, K. Kothapalli, and P. J. Narayanan, "Discrete range searching primitive for the gpu and its applications," *ACM Journal of Experimental Algorithmics*, vol. 17, pp. 4.5:4.1–4.5:4.17, 2012.

S. Guntury and P. J. Narayanan, "Raytracing dynamic scenes on the gpu using grids," *IEEE Transactions on Visualization and Computer Graphics*, vol. 18, no. 1, pp. 5–16, 2012.

P. Agrawal and P. J. Narayanan, "Person de-identification in videos," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 21, no. 3, pp. 299–310, 2011.

J. M. Singh and P. J. Narayanan, "Real-time ray-tracing of implicit surfaces on the gpu," *IEEE Transactions on Visualization and Computer Graphics*, vol. 16, no. 2, 2010. *GoogleScholar Citations:* **45***, MicrosoftAcademic:* **14**.

J. Soman, K. Kothapalli, and P. J. Narayanan, "Some gpu algorithms for graph connected components and spanning tree," *Parallel Processing Letters*, vol. 20, no. 4, pp. 325–339, 2010.

T. Kanade and P. Narayanan, "Virtualized Reality: Perspectives on 4D Digitization of Dynamic Events," *IEEE Computer Graphics and Applications*, vol. 27, no. 3, pp. 32–40, 2007.

Y. C. Lal, C. P. I. Barkan, J. Drapa, N. Ahuja, J. M. Hart, P. J. Narayanan, C. V. Jawahar, A. Kmar, L. R. Milhon, and M. Stehly, "Machine vision analysis of the energy efficiency of intermodal freight trains," *Journal of Rail and Rapid Transit*, vol. 221, no. 3, pp. 353–364, 2007.

Nirnimesh, P. Harish, and P. Narayanan, "Garuda: A Scalable Tiled Display Wall Using Commodity PCs," *IEEE Transactions on Visualization and Computer Graphics*, vol. 13, no. 5, pp. 864–877, 2007. *GoogleScholar*

Citations: **25***, MicrosoftAcademic:* **10**.

NMITLI Team (M. Vidyasagar with 110 others including P. J. Narayanan, Nirnimesh, V. Jain), "BioSuite: A comprehensive bioinformatics software package (A unique industry-academia collaboration)," *Current Science*, vol. 92, no. 1, 2007.

S. K. Penta and P. J. Narayanan, "Compression of multiple depth maps for IBR," *The Visual Computer*, vol. 21, no. 8-10, pp. 611–618, 2005.

S. Kuthirummal, C. V. Jawahar, and P. J. Narayanan, "Fourier Domain Representation of Planar Curves for Recognition in Multiple Views," *Pattern Recognition*, vol. 37, no. 4, pp. 739–754, 2004.

M. Pawan Kumar, S. Goyal, S. Kuthirummal, C. V. Jawahar, and P. J. Narayanan, "Discrete contours in multiple views: approximation and recognition," *Image and Vision Computing*, vol. 22, no. 14, pp. 1229–1239, 2004.

C. V. Jawahar and P. J. Narayanan, "Generalised Correlation for Multi-Feature Correspondence," *Pattern Recognition*, vol. 35, no. 6, pp. 1303–1313, 2002.

C. V. Jawahar and P. J. Narayanan, "An Adaptive Multifeature Correspondence Algorithm for Stereo using Dynamic Programming," *Pattern Recognition Letters*, vol. 23, no. 5, pp. 549–556, 2002.

K. K. Ravi, P. J. Narayanan, and C. V. Jawahar, "A Multimedia-Based City Information System," *IETE Technical Review*, 2001.

T. Kanade, P. W. Rander, and P. J. Narayanan, "Virtualized Reality: Constructing Virtual Worlds from Real Scenes," *IEEE Multimedia*, vol. 4, no. 1, pp. 34–47, 1997. *GoogleScholar Citations:* **527***, MicrosoftAcademic:* **296**.

P. J. Narayanan and L. S. Davis, "Parallel Search for the Interpretation of Aerial Images," *Concurrency: Practice and Experience*, vol. 6, pp. 517–541, 1994.

P. J. Narayanan and L. S. Davis, "Replicated Data Algorithms in Image Processing," *Computer Vision, Graphics, and Image Processing: Image Understanding*, vol. 56, no. 3, pp. 351–365, 1992.

P. J. Narayanan, L. T. Chen, and L. S. Davis, "Effective Utilization of SIMD Parallelism in Low and Intermediate Level Vision," *IEEE Computer*, vol. 25, no. 2, pp. 68–73, 1992.

P. J. Narayanan and L. S. Davis, "Replicated Image Algorithms and Their Analyses on SIMD Machines," *International Journal of Pattern Recognition and Artificial Intelligence*, vol. 6, no. 2&3, 1992.

B. Kamgar-Parsi, P. J. Narayanan, and L. S. Davis, "Surface Reconstruction (of Rough Terrain) in Range Image Shadows," *Pattern Recognition Letters*, vol. 13, no. 9, pp. 657–667, 1992.

Conference Papers:

S. Ravichandran and P. J. Narayanan, "Parallel divide and conquer ray tracing," in *Technical Briefs, SIGGRAPH Asia*, 2013.

A. Deshpande and P. J. Narayanan, "Can gpus sort strings efficiently?," in *High Performance Computing (HiPC)*, 2013.

N. Revanth and P. Narayanan, "Distributed massive model rendering," in *ICVGIP*, 2012.

R. Nigam and P. Narayanan, "Hybrid ray tracing and path tracing of bezier surfaces using a mixed hierarchy," in *ICVGIP*, 2012.

A. Deshpande, S. Choudhary, P. Narayanan, K. Singh, K. Kundu, A. Singh, and A. Kumar, "Geometry directed browser for personal photographs," in *ICVGIP*, 2012.

P. Harish, P. Sakurikar, and P. Narayanan, "Increasing intensity resolution on a single display using spatio-temporal mixing," in *ICVGIP*, 2012.

S. Choudhary and P. J. Narayanan, "Visibility Probability Structure from SfM Dataset and Applications," in *ECCV*, 2012.

H. Sureka and P. J. Narayanan, "Mixed-resolution patch-matching," in *ECCV*, 2012.

P. Sakurikar and P. J. Narayanan, "Fast graph cuts using shrink-expand reparameterization," in *WACV*, pp. 65–71, 2012.

A. Deshpande, I. Misra, and P. J. Narayanan, "Hybrid implementation of error diffusion dithering," in *High Performance Computing (HiPC)*, 2011.

K. W. Mohiuddin and P. J. Narayanan, "Scalable clustering using multiple gpus," in *High Performance Computing (HiPC)*, 2011.

K. W. Mohiuddin and P. J. Narayanan, "A GPU-Assisted Personal Video Organizing System," in *Computer Vision on the GPU (ICCV Workshops)*, pp. 538–544, 2011.

P. Harish and P. Narayanan, "Short paper: View dependent rendering to simple parametric display surfaces," in *Joint Virtual Reality Conference of EGVE-EuroVR*, pp. 27–30, 2011.

R. Shah and P. Narayanan, "Trajectory based video object manipulation," in *IEEE International Conference on Multimedia and Expo (ICME)*, 2011.

S. Srungarapu, D. P. Reddy, K. Kothapalli, and P. J. Narayanan, "Fast two dimensional convex hull on the gpu," in *AINA Workshops*, pp. 7–12, 2011.

J. Soman, K. K. Matam, K. Kothapalli, and P. J. Narayanan, "Efficient discrete range searching primitives on the gpu with applications," in *HiPC*, pp. 1–10, 2010.

R. Shah, P. Narayanan, and K. Kothapalli, "Gpu accelerated genetic algorithms," in *Workshop on Parallel Architectures for Bio-inspired Algorithms (WPABA)*, 2010.

J. Soman, K. Kothapalli, and P. J. Narayanan, "A fast gpu algorithm for graph connectivity," in *IPDPS Workshops*, pp. 1–8, 2010.

S. Guntury and P. J. Narayanan, "Ray tracing dynamic scenes with shadows on the gpu," in *Eurographics Symposium on Parallel Graphics and Visualization*, pp. 27–34, 2010.

S. Choudhary, S. Gupta, and P. J. Narayanan, "Practical Time Bundle Adjustment for 3D Reconstruction on GPU," in *ECCV Workshop on Computer Vision on the GPU*, 2010.

P. K. Dasari and P. J. Narayanan, "Interactive visualization and tuning of sift indexing," in *Proceedings of the Vision, Modeling, and Visualization Workshop*, pp. 97–105, 2010.

P. Harish and P. J. Narayanan, "A view-dependent, polyhedral 3d display," in *International Conference on Virtual Reality Continuum and its Applications in Industry (VRCAI)*, pp. 71–75, 2009.

V. Vineet and P. J. Narayanan, "Solving MultiLabel MRFs using Incremental α-expansion on the GPUs," in *Asian Conference on Computer Vision (ACCV)*, 2009.

P. Agrawal and P. J. Narayanan, "Person De-identification in Videos," in *Asian Conference on Computer Vision (ACCV)*, 2009.

V. Vineet, P. Harish, S. Patidar, and P. J. Narayanan, "Fast minimum spanning tree algorithm for large graphs on the gpu," in *High Performance Graphics*, ACM Press, 2009. *GoogleScholar Citations:* **31**, *MicrosoftAcademic:* **7**.

K. Kothapalli, R. Mukherjee, M. S. Rehman, S. Patidar, P. J. Narayanan, and K. Srinathan, "A performance prediction model for the cuda gpgpu platform," in *HiPC*, pp. 463–472, 2009. *GoogleScholar Citations:* **26**, *MicrosoftAcademic:* **4**.

S. Lahabar and P. J. Narayanan, "Singular Value Decomposition on the GPU using CUDA," in *IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, June 2009. *GoogleScholar Citations:* **53**, *MicrosoftAcademic:* **16**.

M. S. Rehman, K. Kothapalli, and P. J. Narayanan, "Fast and scalable list ranking on the gpu," in *ACM International Confernece on Supercomputing*, pp. 235–243, 2009. *GoogleScholar Citations:* **25**, *MicrosoftAcademic:* **8**.

S. Bhattacharjee and P. J. Narayanan, "Hexagonal geometry clipmaps for spherical terrain rendering," in *SIGGRAPH Asia Sketches*, 2008.

V. Vineet and P. J. Narayanan, "CUDA cuts: Fast graph cuts on the GPU," in *CVPR Workshop on Computer Vision on the GPU*, pp. 1–8, 2008. *GoogleScholar Citations:* **148**, *MicrosoftAcademic:* **40**.

S. Bhattacharjee and P. J. Narayanan, "Real-time painterly rendering of terrains," in *Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP)*, 2008.

S. Bhattacharjee, S. Patidar, and P. J. Narayanan, "Real-time rendering and manipulation of large terrains," in *Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP)*, 2008.

B. N. Kumar and P. J. Narayanan, "Algebraic splat representation and rendering for point based models," in *Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP)*, 2008.

S. Patidar and P. J. Narayanan, "Ray casting deformable models on the gpu," in *Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP)*, 2008.

D. R. Vaka, P. J. Narayanan, and C. V. Jawahar, "Attention-based super resolution from videos," in *Indian Conference on Computer Vision, Graphics, and Image Processing (ICVGIP)*, 2008.

P. Verlani and P. J. Narayanan, "A parametric proxy-based compression of depth movies," in *DCC*, p. 550, 2008.

P. Verlani and P. J. Narayanan, "Proxy-based compression of $2\frac{1}{2}$-d structure of dynamic events for tele-immersive systems," in *3D Data Processing, Visualization and Transmission (3DPVT)*, 2008.

V. Chari, C. V. Jawahar, and P. J. Narayanan, "Video completion as noise removal," in *National Conference on Communications (NCC)*, 2008.

V. Chari, J. M. Singh, and P. J. Narayanan, "Augmented reality using over-segmentation," in *NCVPRIPG*, 2008.

S. Lahabar, P. Agrawal, and P. J. Narayanan, "High Performance Pattern Recognition on GPU," in *NCVPRIPG*, 2008.

P. Harish and P. J. Narayanan, "Accelerating large graph algorithms on the GPU using CUDA," in *Inernational Conference on High Performance Computing (HiPC)*, December 2007. *GoogleScholar Citations:* **296**, *MicrosoftAcademic:* **64**.

A. M. Namboodiri, P. J. Narayanan, and C. V. Jawahar, "Using classical poetry structure for indian language post-processing," in *International Conference on Document Analysis and Recognition(ICDAR)*, September 2007.

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