Subarna Tripathi

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Education

2013–2018 **PhD, Electrical and Computer Engineering**, *University of California San Diego*, USA.

Dissertation **Improving Object Detection and Segmentation by Utilizing Context**

2007–2011 **MS Research, Electrical Engineering**, *Indian Institute of Technology, Delhi*, India.

2001–2005 **BTech, Computer Science and Engineering**, *West Bengal University of Technology*, India.

Professional & Research Experiences

May 2018 – present **Research Scientist**, Intel Labs.
Research areas in computer vision including scene graphs, 3D deep learning, video understanding.

Jun 2013 – Mar 2018 **Graduate Research Assistant**, UC San Diego.
Improving Object Detection and Segmentation by utilizing contexts.

Sept 2016– to Dec 2016 **Research Intern**, Qualcomm Multimedia R&D, San Diego, USA.
A low-complexity Object-Detection model using Deep CNN with TensorFlow-Slim

Jun 2016– to Sept 2016 **Research Intern**, Google Research and Machine Intelligence, Seattle, USA.
Person instance segmentation with human pose using Deep CNN with TF-Slim. Follow-up work used in **Portrait Mode** of Pixel Phones

Jun 2015 – Sept 2015 **Research Intern**, Microsoft Research, Redmond, USA.
Self-calibrating eye-gaze tracking for head mounted virtual reality systems.

May 2006 – Oct 2012 **Technical Leader**, STMicroelectronics, Noida and Bangalore, India.
Computer Vision, Stereo Vision, Machine Learning, Object Tracking, Video Compression - applied research projects in the Advanced System Technology (AST) group.

Jul 2005 – May 2006 **Member of Technical Staff**, Interra Systems, Noida, India.
I developed TraceViewer, MP4/3GPP analyzer for Interra's *Vega* Video Analyzer.

Selected Publications

Papers **Remark**, *For full paper list see:*, Google Scholar Profile.

[21] **SG2Caps:Revisiting Scene Graphs for Image Captioning**, *Subarna Tripathi*, Kien Nguyen*, Tanaya Guha, Bang Du, Truong Nguyen*, arXiv preprint arXiv:2102.04990.

[20] **Dynamic Emotion Modeling with Learnable Graphs and Graph Inception Network**, *Amir Shirian, Subarna Tripathi, Tanaya Guha*, IEEE Trans on Multimedia, 2021.

[19] **Structured-Query based Image Retrieval Using Scene Graphs**, *Brigit Schroeder, Subarna Tripathi*, CVPR workshop DIRA, 2020.

[18] **Generating Images in Compressed Domain using Generative Adversarial Networks**, *B. Kang, S. Tripathi, and T. Nguyen*, Accepted in IEEE Access, 2020.

[17] **Layout Compositions from Attributed Scene Graphs**, *Subarna Tripathi, and Anahita Bhiwandiwalla*, NeurIPS workshop (WiML), 2019.

[16] **Triplet-Aware Scene Graph Embedding**, *Brigit Schroeder, Subarna Tripathi, and Hanlin Tang*, ICCV workshop (SGRL), 2019.

[15] **Heuristics for Image Generation from Scene Graphs**, *Subarna Tripathi, Anahita Bhiwandiwalla, Alexei Bastidas, and Hanlin Tang*, ICLR workshop (LLD), 2019.

[14] **Compact scene graphs for layout composition and patch retrieval**, *Subarna Tripathi, Sharath Nittur Sridhar, Sundaresan and Hanlin Tang*, CVPRW (CEFRL), 2019.

[13] **Using Scene Graph Context to Improve Image Generation**, *Subarna Tripathi, Anahita Bhiwandiwalla, Alexei Bastidas, and Hanlin Tang*, CVPRW (WiCV), 2019.

[12] **PartNet: A Large-scale Benchmark for Fine-grained and Hierarchical Part-level 3D Object Understanding**, *Kaichun Mo, Shilin Zu, Angel X. Chang, Li Yi, Subarna Tripathi, Leonidas J. Guibas, Hao Su*, CVPR, 2019.

[11] **Pose2Instance: Harnessing Keypoints for Person Instance Segmentation**, *S. Tripathi, M. Collins, M. Brown, and S. Belongie*, arXiv preprint arXiv:1704.01152, Follow-up work used in **Portrait Mode** of Pixel Phones.

[10] **Correction by Projection: Denoising Images by Inferring Latent Vectors from Generative Adversarial Networks**, *S. Tripathi, Z.C. Lipton, and T. Nguyen*, arXiv preprint arXiv:1803.04477.

[9] **LCDet: Low-Complexity Fully-Convolutional Neural Networks for Object Detection in Embedded Systems**, *S. Tripathi, G. Dane, B. Kang, V. Bhaskaran, and T. Nguyen*, CVPRW, 2017.

[8] **Low-Complexity Object Detection with Deep Convolutional Neural Network for Embedded Systems**, *S. Tripathi, B. Kang, G. Dane, and T. Nguyen*, SPIE, 2017.

[7] **Precise Recovery of Latent Vectors from Generative Adversarial Networks**, *Z.C. Lipton, and S. Tripathi*, ICLR 2017, Workshop track.

[6] **A Statistical Approach to Continuous Self-Calibrating Eye Gaze Tracking for Head-Mounted Virtual Reality Systems**, *S. Tripathi, and B. Guenter*, WACV 2017, (**The Best Paper Award**).

[5] **Context Matters: Refining Object Detection in Video with Recurrent Neural Networks**, *S. Tripathi, Z. Lipton, S. Belongie, and T. Nguyen*, BMVC, 2016.

[4] **Detecting Temporally Consistent Objects in Videos through Object Class Label Propagation**, *S. Tripathi, S. Belongie, Y. Hwang, and T. Nguyen*, WACV, 2016.

[3] **Semantic Video Segmentation : Exploring Inference Efficiency**, *S. Tripathi, S. Belongie, Y. Hwang, and T. Nguyen*, IEEE ISOCC, 2015.

[2] **Real-time Sign Language Fingerspelling Recognition using Convolutional Neural Networks from Depth map**, *B. Kang, S. Tripathi, and T. Nguyen*, ACPR, 2015.

[1] **Improving Streaming Video Segmentation with Early and Mid-Level Visual Processing**, *S. Tripathi, Y. Hwang, S. Belongie, and T. Nguyen*, WACV, 2014.

Patents [7] **Moving object detection and classification image analysis methods and systems**, *S. Tripathi, K Chen, T Nguyen, and Y Hwang*, US Patent App. 15/872,378.

[6] **Method for Detecting a Straight Line in a Digital Image**, *L. Magri, B. Rossi, S. Tripathi, P. Fragneto and E. Piccinelli*, US 9,245,200 B2, Grant.

[5] **GOP-Independent Dynamic Transcoder Bitrate Controller**, *S. Tripathi, and E. Piccinelli*, US 8,913,658 B2, Grant.

[4] **Advance video coding with perceptual quality scalability for regions of interest**, *S. Chaudhury, S. Tripathi, and M. Mathur*, US 9,626,769 B2, Grant.

[3] **Object Tracking**, *S. Chaudhury, S. Tripathi, and S. Dutta Roy*, US 10178396 B2, Grant.

[2] **System and method for object based parametric video coding**, *S. chaudhury, M. Mathur, A. Khandelia, S. Tripathi, B. Lall, S. Dutta Roy, and S. Gorecha*, US 8,848,802 B2, Grant.

[1] **A Method and System for Determining A Macroblock Partition For Data Transcoding**, *S. Tripathi, K. Saha and E. Piccinelli*, US 9,197,903 B2, Grant.

Book Chapter **Animation and Flash Overview**, *Computer Graphics Multimedia and Animation*, Dr. Malay Pakhira, Prentice Hall of India.

Professional Activities

Co-organizer CVPR 2020 WORKSHOP Diagram Image Retrieval and Analysis (DIRA): Representation, Learning, and Similarity Metrics;

PC member/ Reviewer CVPR, ICCV, ECCV, ACCV, SIGGRAPH, WACV, AAAI, IJCV, ICMLA, IEEE JOURNALS, AND OTHERS

Area Chair WiML @NeurIPS 2017, 2019

Media Coverage

Press **PartNet featured in IEEE Spectrum, The Robot Report, Robotics Business Review, VentureBeat, TechCrunch**.

Intel Internal **Intel Newsroom and Intel AI Blog**.

Others **Diversity in Deep Learning Research Panelist**, *Mentions in KDNuggets and Medium*.

Co-curricular and Extra-curricular Activities

Scholarships **National Scholarship of Merit**, 1999, 2001, India.

Awards **Google Grace Hopper Celebration Award, Travel scholarship**, 2016.

Mentoring **Undergrad Students**, *TCS-best project award for YUV sequence Viewer*, 2007.

Courses **Computer Vision, Machine Learning, Pattern Recognition, Image Processing**.

Summer Schools **DLSS & RLSS'17 Montreal, ICVSS'11 Sicily, IMLSS'10 Bangalore**.