

# Subarna Tripathi

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📄 <https://subarnatripathi.github.io/>

I lead the Visual Algorithms Research team with a focus on long-term video understanding and generation, structured and multimodal learning at Intel AI Lab. My additional responsibilities include helping in strategizing and looking over Intel's global university investments in AI.

## 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/Manager**, VISUAL ALGO RESEARCH @INTEL LABS.  
Structured video and multimodal representation learning.
- Jun 2013 – **Graduate Research Assistant**, UC SAN DIEGO.  
Mar 2018 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 – **Research Intern**, MICROSOFT RESEARCH, Redmond, USA.  
Sept 2015 Self-calibrating eye-gaze tracking for head mounted virtual reality systems.
- May 2006 – **Technical Leader**, STMICROELECTRONICS, Noida and Bangalore, India.  
Oct 2012 Computer Vision, Stereo Vision, Machine Learning, Object Tracking, Video Compression - applied research projects in the Advanced System Technology (AST) group.
- Jul 2005 – **Member of Technical Staff**, INTERRA SYSTEMS, Noida, India.  
May 2006 I developed TraceViewer, MP4/3GPP analyzer for Interra's Vega Video Analyzer.

## Selected Publications

- Papers **Remark**, For full paper list see:, [Google Scholar Profile](#).
- [39] **Harnessing Object Grounding for Time-Sensitive Video Understanding**, Tz-Ying Wu, Sharath Nittur Sridhar, and Subarna Tripathi, under review, 2024.
- [38] **Graph-Based Multimodal and Multi-view Alignment for Keystep Recognition**, Julia Lee Romero, Kyle Min, Subarna Tripathi, and Morteza Karimzadeh, under review, 2024.
- [37] **Ego-VPA: Egocentric Video Understanding with Parameter-efficient Adaptation**, Tz-Ying Wu, Kyle Min, Subarna Tripathi, and Nuno Vasconcelos, accepted for publication at WACV, 2025.
- [36] **3-series Blog on Long-Form Video Representation Learning Towards Data Science Blog**, Subarna Tripathi, 2024.
- [35] **LAVITI- Constrative Language-Video-Time Pretraining**, Hengyue Liu, Kyle Min, Hector A Valdez, Subarna Tripathi, EgoVis workshop @ CVPR, 2024.
- [34] **SViT-Ego: A Sparse Video-Text Transformer for Egocentric Video**, Hector A Valdez, Kyle Min, and Subarna Tripathi, under review, 2024.
- [33] **VideoSAGE: Video Summarization with Graph Representation Learning**, JM Rojas Chaves, and Subarna Tripathi, CVPRW, 2024.
- [32] **Action Scene Graphs for Long-Form Understanding of Egocentric Videos**, Ivan Rodin\*, Kyle Min\*, Antonino Furnari\*, Subarna Tripathi, and Giovanni Maria Farinella, CVPR 2024.

- [31] **Unbiased video scene graph generation**, Sayak Nag, Kyle Min, Subarna Tripathi, Amit K. Roy-Chowdhury, CVPR 2023.
- [30] **SViT: Temporal Learning of Sparse Video-Text Transformer**, Yi Li, Kyle Min, Subarna Tripathi, Nuno Vasconcelos, CVPR 2023.
- [29] **Single-Stage Visual Relationship Learning using Conditional Queries**, Alakh Desai, Tz-Ying Wu, Subarna Tripathi, Nuno Vasconcelos, NeurIPS, 2022.
- [28] **Learning Long-Term Spatial-Temporal Graphs for Active Speaker Detection**, Kyle Min\*, Sourya Roy\*, Subarna Tripathi, Tanaya Guha, and Somdeb Majumdar, ECCV 2022.
- [27] **Text Spotting Transformers**, Xiang Zhang, Yongwen Su, Subarna Tripathi and Zhuowen Tu, CVPR, 2022.
- [26] **Joint Hand Motion and Interaction Hotspots Prediction from Egocentric Videos**, Shaowei Liu, Subarna Tripathi, Somdeb Majumdar, Xiaolong Wang, CVPR, 2022.
- [25] **Exploiting Long-Term Dependencies for Generating Dynamic Scene Graphs**, Shengyu Feng, Subarna Tripathi, Hesham Mostafa, Marcel Nassar, Somdeb Majumdar, WACV 2023.
- [24] **Towards Single Image Panoptic 3D Parsing in the Wild**, Sainan Liu, Vincent Nguyen, Yuan Gao, Subarna Tripathi, Zhuowen Tu, arXiv preprint, arXiv:2021.
- [23] **Self-Supervision for Scene Graph Embeddings**, Brigit Schroeder, Adam Smith, Subarna Tripathi, WiML at NeurIPS, 2021.
- [22] **In Defense of Scene Graphs for Image Captioning**, Kien Nguyen\*, Subarna Tripathi\*, Tanaya Guha, Bang Du, Truong Nguyen, ICCV 2021.
- [21] **Learning of Visual Relations: The Devil is in the Tails**, Alakh Desai\*, Tz-Ying Wu\*, Subarna Tripathi, Nuno Vasconcelos, ICCV 2021.
- [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, 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.
- [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 ISOC, 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
- [8] **Long duration structured video action segmentation**, *AD Rhodes, B Min, S Tripathi, G Raffa, S Biswas*, US Patent App. 18/459,824.
  - [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

- SRC Services INTEL'S Center Lead Liaison for JUMP2.0 COCOSYS, The AI Hardware Technical Advisory Board (TAB) member since 2023.
- Co-organizer CVPR'20 WORKSHOP Diagram Image Retrieval and Analysis (DIRA): Representation, Learning, and Similarity Metrics;
- Co-leader WiML UNWORKSHOP@ICML'21 Connecting Novel Perspectives of GNNs: A Cross-domain Overview;
- Guest speaker DEEP LEARNING COURSE @University of Catania (2022, 2023, 2024)
- Mentoring session WiCV@CVPR'21, WiML@NEURIPS'21, UCSD ECE AMP 2020-2022
- PC member/Reviewer CVPR, ICCV, ECCV, ACCV, SIGGRAPH, WACV, AAAI, IJCV, IEEE JOURNALS
- Area Chair WiML @NEURIPS 2017-TO DATE

## 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 **Intel Ignite Companies, AI Global Impact Festival**, Grad and Undergrad Students.  
Mentoring at WiML, WiCV, AI Impact Festival Winners
- Courses **Computer Vision, Machine Learning, Pattern Recognition, Image Processing.**
- Summer **DLSS & RLSS'17 Montreal, ICVSS'11 Sicily, IMLSS'10 Bangalore.**
- Schools