Vishwanath Sindagi

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Summary

About Me — I am a PhD candidate in the ECE dept. at Johns Hopkins University. My current research is on computer vision and machine learning with a specific focus on deep-learning based crowd analytics and object detection. I have also worked on domain adaptation, and image restoration. I have over 6 years of industry experience involving research and development of several computer vision based features for different products.
[Homepage] [Google Scholar] [LinkedIn]

Education

2018–Now **Johns Hopkins University**.
Ph.D in Electrical and Computer Engineering (transferred from Rutgers)
Advisor: Prof. Vishal M. Patel

2016–2018 **Rutgers University**.
Ph.D in Electrical and Computer Engineering
Advisor: Prof. Vishal M. Patel

2007–2009 **Intl Institute of Information Technology Bangalore (IIIT-B)**.
M Tech in Information Technology

Experience

Sept 2018- -Now **Johns Hopkins University**, *Baltimore, MD (Graduate Research Assistant)*.
Research on computer vision and machine learning with a specific focus on deep learning based object detection, image-based crowd analytics, domain adaptation, GANs and image restoration.

June 2020- -Aug 2020 **Facebook AI**, *Boston, MA (Research Intern)*.
Research on domain adaptive multi-modal learning.

May 2019- -Aug 2019 **Apple Inc**, *Santa Clara, California (AI Research Intern)*.
Research on Human shape estimation.

Jun 2018- -Aug 2018 **Apple Inc**, *Santa Clara, California (AI Research Intern)*.
Research on multi-modal object detection.

Aug 2016- -May 2018 **Rutgers University**, *Piscataway, NJ (Graduate Research Assistant)*.
Research on computer vision and machine learning with a specific focus on deep learning and small object detection, cnn-based crowd analytics, applications of generative modeling (GANs) and low-level vision.

Dec 2012- -July 2016 **Samsung R&D Institute Bangalore (SRIB)**, *Bangalore, India (Chief Engineer)*.
Lead the development efforts of key features related to computational photography, video analytics and machine vision.

Jul 2009- -Nov 2012 **AllGoVIsion**, *Bangalore, India (Sr. Software Engineer)*.
Responsible for end-to-end development of video analytics suite with several features like motion detection, tracking, object recognition, behavioural analytics and image stitching.

Selected Works

Domain Adaptation
- Prior-based Domain Adaptive Object Detection for Adverse Weather Conditions. ECCV 2020.
- Syn2Real Transfer Learning for Image Deraining using Gaussian Processes. CVPR 2020.
- Domain Adaptive Support Vector Data Description for OLED Defect Detection. IJCV 2017.

Semi/Un-supervised
- Learning to Count in the Crowd from Limited Labeled Data. ECCV 2020.
- Completely Self-Supervised Crowd Counting via Distribution Matching. Under Review at T-PAMI 2020.

Detection & Counting
- Unconstrained Crowd Counting. ICCV 2019.
- Multi-level Feature Fusion for Crowd Counting. ICCV 2019.
- MVX-Net: Multimodal VoxelNet for 3D Object Detection. ICRA 2019.
- DAFE-FD: Density Aware Feature Enrichment for Face Detection. WACV 2019.
- Contextual Pyramid CNN for Crowd Counting. ICCV 2017.

Publications & Patents

Conference

V.A. Sindagi*, P Oza*, R Yasarla and V.M. Patel, "Prior-based Domain Adaptive Object Detection for Adverse Weather Conditions". *European Conference on Computer Vision (**ECCV**) 2020*.

V.A. Sindagi, R Yasarla, D S Babu, R. V. Babu and V.M. Patel, "Learning to Count in the Crowd from Limited Labeled Data". *European Conference on Computer Vision (**ECCV**) 2020*.

V J M Jose and **V.A. Sindagi**, I Hacihaliloglu and V.M. Patel, "KiU-Net: Towards Accurate Segmentation of Biomedical Images using Over-complete Representations". *Intl Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI**) 2020*.

R Yasarla* and **V.A. Sindagi*** and V.M. Patel, "Syn2Real Transfer Learning for Image Deraining using Gaussian Processes". *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**) 2020*.

V.A. Sindagi, R Yasarla and V.M. Patel, "Pushing the Frontiers of Unconstrained Crowd Counting: New Dataset and Benchmark Method". *IEEE Intl Conference on Computer Vision (**ICCV**) 2019*.

V.A. Sindagi and V.M. Patel, "Multi-Level Bottom-Top and Top-Bottom Feature Fusion for Crowd Counting". *IEEE Intl Conference on Computer Vision (**ICCV**) 2019*.

V.A. Sindagi and V.M. Patel, "Inverse Attention Guided Deep Crowd Counting Network". *IEEE Intl Conference on Advanced Video and Signal based Surveillance (**AVSS**) 2019*. ***[Best Paper Award]***

V.A. Sindagi, Y Zhou and V.M. Patel, "MVX-Net: Multimodal VoxelNet for 3D Object Detection". *IEEE Intl Conference on Robotics and Automation (**ICRA**) 2019*.

V.A. Sindagi and V.M. Patel, "DAFE-FD: Density Aware Feature Enrichment for Face Detection". *IEEE Winter Conference on Applications of Computer Vision (**WACV**) 2019*.

He Zhang, **V.A. Sindagi** and V.M. Patel, "Multi-scale Single Image Dehazing using Perceptual Pyramid Deep Network". *IEEE Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**) 2018*.

C Ancuti *et al*. "NTIRE 2018 challenge on image dehazing: Methods and results". *IEEE Conference on Computer Vision and Pattern Recognition Workshops (**CVPRW**) 2018*.

H Nada, **V.A. Sindagi**, He Zhang and V.M. Patel, "Pushing the Limits of Unconstrained Face Detection: a Challenge Dataset and Baseline Results ". *IEEE Intl Conference on Biometrics: Theory, Applications, and Systems (**BTAS**) 2018*.

X Di, **V.A. Sindagi** and V.M. Patel, "GP-GAN: Gender Preserving GAN for Synthesizing Faces from Landmarks". *IEEE Intl Conference on Pattern Recognition (**ICPR**) 2018* ***[Best paper award]***.

L Wang, **V.A. Sindagi**, and V.M. Patel, "High-Quality Facial Photo-Sketch Synthesis Using Multi-Adversarial Network". *IEEE Intl Conference on Automatic Face and Gesture Recognition (**FG**) 2018*.

V.A. Sindagi and V.M. Patel, "Generating High-Quality Crowd Density Maps using Contextual Pyramid CNNs". *IEEE Intl Conference on Computer Vision (**ICCV**) 2017*.

V.A. Sindagi and V.M. Patel, "CNN-based Cascaded Multi-task Learning of High-level Prior and Density Estimation for Crowd Counting". *IEEE Intl Conference on Advanced Video and Signal-based Surveillance (**AVSS**) 2017* ***[Best paper award]***.

V.A. Sindagi and S. Srivastava, "OLED Panel Defect Detection Using Local Inlier-Outlier Ratios and Modified LBP". *IAPR Intl Conference on Machine Vision Applications (**MVA**) 2015* .

Journal

V.A. Sindagi and V.M. Patel, "HA-CCN: Hierarchical Attention-based Crowd Counting Network". *IEEE Transactions on Image Processing (**TIP**) 2019*.

H. Zhang, **V.A. Sindagi** and V.M. Patel, "Image De-raining Using a Conditional Generative Adversarial Network". *IEEE Transactions on Circuits and Systems for Video Technology (**TCSVT**), accepted for publication, 2019*.

H. Zhang, **V.A. Sindagi** and V.M. Patel, "Joint Transmission Map Estimation and Dehazing using Deep Networks". *IEEE Transactions on Circuits and Systems for Video Technology (**TCSVT**) 2019*.

V.A. Sindagi and V.M. Patel, "A Survey of Recent Advances in CNN-based Single Image Crowd Counting and Density Estimation". *Pattern Recognition Letters (**PRL**), 2018*.

V.A. Sindagi and S. Srivastava, "Domain Adaptation for Automatic OLED Panel Defect Detection Using Adaptive Support Vector Data Description". *Intl Journal of Computer Vision (**IJCV**), 2017*.

Pre-prints

V.A. Sindagi, R Yasarla and V.M. Patel, "JHU-CROWD++: Large-Scale Crowd Counting Dataset and A Benchmark Method". *Under review at **T-PAMI** 2020*.

D. B. Sam, A Agarwalla, J Joseph, **V.A. Sindagi**, R. V. Babu and V. M. Patel, "Completely Self-Supervised Crowd Counting via Distribution Matching". *Under review at **T-PAMI** 2020*.

Patents

"Method and system for enhancing human skin in media". *Submitted to Indian Patent Office (2424/CHE/2015)*.

Industry Experience (Project profile)

Samsung R&D

- Automatic fast event detection for slow video playback.
- Intelligent scene framing for camera application using salient object detection.
- Low light photography: Image enhancement method via blur and noisy image fusion.
- Machine vision: OLED panel defect detection using hand engineered features and SVM.
- Image set summarization using Bag of Visual Words (BoVW) and k-means clustering.
- Object tracking using TLD (Tracking, Learning and Detection), MIL (Multiple Instance Learning) and CMT (Consensus based Matching and Tracking of objects).
- Scene recognition using Bag of Visual Words (BoVW) and spatial pyramid kernel.
- GPU optimization of video surveillance algorithms (background subtraction using NPMD and mixture of Gaussians, video stabilization using optical flow, RANSAC homography).

AllGoVision

- Object detection and counting using HOG features and SVM for a retail giant.
- Video/image stitching using SURF features and RANSAC homography.
- Behavioral analytics: detection of loitering, wrong-way, illegal parking, camera tampering and left baggage.
- Background subtraction using mixture of Gaussians and its adaption to large changes in illumination.
- Parts based object tracking using mean-shift algorithm.

Technical Skills

Programming C/C++, Python, Matlab, R.

Frameworks Caffe, PyTorch.

Academic Services

Reviewer CVPR, ICCV, ECCV, Neurips, WACV, SIGGRAPH-Asia, T-PAMI, TIP, IJCV, Pattern Recognition Letters.

Web-chair ICB 2018, WACV 2020, AVSS 2021

Awards

- Outstanding Reviewer Award, ECCV 2020
- Best Paper Award at AVSS 2019
- Best Student Paper Award at ICPR 2018
- NTIRE Dehazing Challenge Winner CVPR 2018
- Best Paper Award at AVSS 2017