Vinod K. Kurmi

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Research Interests: Computer Vision, Machine Learning, Domain Adaptation, Bayesian Neural Network, Multimodal Learning.

Education

2015–Present **Doctor of Philosophy in Electrical Engineering**, *Indian Institute of Technology, Kanpur*, India.

2012–2014 **Masters of Technology in Electrical Engineering**, *Indian Institute of Technology, Kanpur*, India.

2008–2012 **Bachelor of Engineering in Electronics & Telecommunication**, *SGSITS Indore*, India.

Patents

2015 **Vinod K Kurmi**, Garima Jain, KS Venkatesh, "A Human-Hand Detection System, Apparatus and a Method Thereof" India PO No.1678/DEL/2015.

Conference Publications

CVPR-19 **Vinod K. Kurmi***, Shanu Kumar*, Vinay P. Namboodiri,"Attending to Discriminative Certainty for Domain Adaptation", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), Long Beach, California, USA, 2019*

BMVC-19 **Vinod K. Kurmi**, Vipul Bajaj, Venkatesh K Subramanian, Vinay P. Namboodiri,"Curriculum based Dropout Discriminator for Domain Adaptation", *British Machine Vision Conference (**BMVC**) , Cardiff, UK, 2019*

IJCNN-19 **Vinod K. Kurmi**, Vinay P. Namboodiri,"Informative Discriminator for Domain Adaptation", *International Joint Conference on Neural Networks (**IJCNN**), Budapest, Hungary, 2019.* (**Oral Presentation**)

EMNLP-18 Badri N. Patro, Sandeep K., **Vinod K. Kurmi**, Vinay P. Namboodiri,"Multimodal Differential Network for Visual Question Generation", *Conference on Empirical Methods in Natural Language Processing (**EMNLP**), Brussels, Belgium, 2018.*

COLING-18 Badri N. Patro*, **Vinod K. Kurmi***, Sandeep Kumar*, Vinay P. Namboodiri,"Learning Semantic Sentence Embeddings using Pair-wise Discriminator", *Proceedings of 27th International Conference on Computational Linguistics (**COLING**), Santa Fe, New Mexico, USA, 2018.*

** equal contributions*

WSCG-15 **Vinod K Kurmi**, G. Jain, KS Venkatesh,"Robust Human Gesture Recognition form 3D Data" *WSCG 2015, 23rd International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision(**WSCG**), Czech Republic,2015.*

Workshop Publications

ICCVW-19 Badri N. Patro, Sandeep Kumar, **Vinod K. Kurmi**, Vinay P. Namboodiri,"Multimodal Differential Network for Visual Question Generation", **ICCV Workshop** (CLVL), Seoul, South Korea, 2019. (4 page paper) (**Spotlight**)

ICCVW-19 Badri N. Patro*, **Vinod K. Kurmi***, Sandeep Kumar*, Vinay P. Namboodiri,"Learning Semantic Sentence Embeddings using Pair-wise Discriminator", **ICCV Workshop**(CLVL), Seoul, South Korea, 2019. (4 page paper)(**Spotlight**)

Under Submission Work

2019 *In the area of* **Domain Adaptation**- Submitted in CVPR 2020

2019 *In the area of* **Incremental Learning**- Submitted in CVPR 2020

2019 *In the area of* **Mutli-Modal Learning**- Submitted in ICASSP 2020

2019 *In the area of* **Question Generation**- Submitted in WACV 2020

PhD Research Work

Title **Domain Adaptation through Adversarial and Probabilistic Techniques**.

Supervisors Prof. Vinay P. Namboodiri(CSE) and Prof. K S Venkatesh(EE).

Description In the thesis we consider various problems faced in domain adaptation such as mode collapse and the fact that most adaptation is based on point estimates. We address these limitations by proposing a variety of techniques such as improved discriminator, considering distribution based adaptation, obtaining uncertainty and through these obtaining localized adaptation, addressing multiple modalities in adaptation. Through various methods proposed we are able to considerably improve the state of the art in domain adaptation in various ways.

Work Experiences

2014 **Computer Vision Lab IIT Kanpur**, *Senior Student Research Associate*, Kanpur, India.

Description Developed a middleware for human hand detection from the Kinect Depth sensor data. It overcome the issues of Microsoft's SDK, which requires the full human pose to detect the hand position.

Fellowships and Awards

2019 Qualified in **Qualcomm Innovation Fellowship** 2019 Finalists.

2017 Achieved **Top 20 Rank** and awarded by cash prize at Summer school of Machine Learning at Centre for Visual Information Technology (CVIT) Hyderabad

2017 Achieved **Top 20 Rank** and awarded by cash prize at Summer school of Computer Vision at Centre for Visual Information Technology (CVIT) Hyderabad

2016 **TCS Research Fellowship** Award for 4 years(2015-2019)

2014-2015 Recipient of **MHRD** PhD Fellowship

2014 Qualified for **Junior Research Fellowship (JRF)** of CSIR -NET

2012-2014 Recipient of **MHRD** Post-Graduate Fellowship

Travel Grants

2019 **Microsoft** Travel Grant for IJCNN 2019.

2019 **Google** Travel Grant for CVPR 2019.

2019 **Microsoft** Travel Grant for CVPR 2019.

2019 **EE, IIT Kanpur** Travel Grant for IJCNN 2019.

Teaching Experiences

2019 **Tutor**, *Introduction to Electronics*, ESC201, Autumn, IIT Kanpur.

2017 **Teaching Assistant**, *Signal, Systems and Networks*, EE200, Winter, IIT Kanpur .

2016 **Teaching Assistant**, *Introduction to Electronics*, ESC201, Autumn, IIT Kanpur.

2016 **Teaching Assistant**, *Introduction to Electronics*, ESC201, Winter, IIT Kanpur.

2015 **Teaching Assistant**, *Computer Vision Lab*, Autumn,IIT Kanpur.

2015 **Teaching Assistant**, *Department Post-Graduation Committee*, Winter, IIT Kanpur.

2014 **Teaching Assistant**, *Department Post-Graduation Committee*, Winter, IIT Kanpur.

2013 **Teaching Assistant**, *Introduction to Electronics*, ESC201, Autumn, IIT Kanpur.

2012-13 **Teaching Assistant**, *Department Post-Graduation Committee*, IIT Kanpur.

Technical Skills

Deep learning Torch, Pytorch, Caffe,OpenCV

Language : Lua, Python, C, C++, MATLAB

Tools : Source Insight, LaTeX, Rhapsody, Perforce.

IDE : Code Composer Studio, Keil, Sublime.

Industrial Collaboration Projects

2014 Gesture Recognition System of Smart TV (Samsung-IITK collaboration Project)

Industrial Workshops

2019 Participated in **Amazon Research Day** 2019 at Bangalore sponsored by Amazon

2018 Participated in **Amazon Research Day** 2018 at Bangalore sponsored by Amazon

2017 Attended summer school on **Advance Computer Vision using Deep learning** at IIIT Hyderabad

2017 Attended summer School on Machine Learning using Deep Learning at IIIT Hyderabad

2016 Attended Mysore Park Workshop on **Vision, Language and AI** at VLAI 2016, Mysore

2016 Attended summer School on Deep Learning at IIIT Hyderabad

Technical Course Projects

2015 Gaussian Process based Hallucination of features for object classification (Machine Learning in Computer Vision)

2015 Study of Clustering and Classification Technique for Analytical Data Sets (Convex Optimization)

2015 Indoor Positioning Using UWB-IR Signals in the Presence of Dense Multipath with Path Overlapping (Statistical Signal Processing)

2013 Cooperative MIMO Multicell Networks (Wireless Communications)

2012 GPS based Vehicle Tracking System (B.E Project)

Professional Services

2019 Served as a reviewer in IEEE Transactions on Neural Networks and Learning Systems(**TNNS**)

2018-19 Served as a reviewer in conference **ECML-PKDD, WACV, ICVGIP, NCVPRIG** and Workshop on ML4H at **NeuIIPS**

2019 Delivered oral presentation on 'Looking back at Labels: A Class based Domain Adaptation Technique' at **IJCNN** at Budapest(Hungary)

2019 Presented poster on 'Attending to Discriminative Certainty for Domain Adaptation' at **CVPR** at Long Beach, CA(USA)

2018 Presented poster on 'Learning Semantic Sentence Embeddings using Pair-wise Discriminator' at **Amazon Research Day** at Banglore(India)

2017 Presented poster on 'Domain Adaptation on Computer Vision' at Electrical Engineering **IIT Kanpur Research Day**

2016 Delivered State-of-the-Art seminar on 'Domain Adaptation and Modality Hallucination' at Electrical Engineering **IIT Kanpur**

Github Codes

2018 **Learning Semantic Sentence Embeddings using Pair-wise Discriminator**, *:* .
- `https://github.com/vinodkkurmi/Visual_Question_Generation`.

2018 **Multimodal Differential Network for Visual Question Generation**, *:*.
- `https://github.com/vinodkkurmi/Visual_Question_Generation`.

2019 **Looking back at Labels: A Class based Domain Adaptation Technique**, *:*.
- `https://github.com/vinodkkurmi/DiscriminatorDomainAdaptation`.

2019 **Curriculum based Dropout Discriminator for Domain Adaptation**, *:*.
- `https://github.com/vinodkkurmi/CD3A`.

2019 **Attending to Discriminative Certainty for Domain Adaptation**, *:*.
- `https://github.com/vinodkkurmi/cada`.