

Vijay Kumar

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WORK EXPERIENCE

Senior Data Scientist, Walmart Labs, Bangalore

April 2020 - present

- **Search and Personalization.** Recommendation system for grocery substitution for Walmart
- Responsible for complete revamp for current system to with state-of-the-art machine learning approaches, leading a small focused team of data scientists and interns
- Co-ordinating with product and engineering teams to build supporting infrastructure.

Postdoctoral Researcher, Willow, INRIA, Paris

July 2018 - Dec 2019

Advisor: Dr. Ivan Laptev

- **Spatio-temporal human action localization in movies.** Proposed a graph neural network to model long-term person interactions in movie shots. Our model that considers multiple contextual cues produces 10% relative improvement over several state-of-the-art video features (e.g. I3D, slowfast)
- **Weakly supervised action localization.** Model based on discriminative clustering that integrates different types of supervision as constraints on the optimization.
- Worked closely with the funding agency and a french defense company to develop computer vision system for abnormal (violent) human action detection in surveillance videos.
- Supervised several student teams with their computer vision course projects at ENS Paris-Saclay.

Advisor, Kukun Inc

Jan 2015 - Dec 2019

Provided mentorship on multiple ML projects for house renovation.

Research Assistant, Center for Visual Information Technology (CVIT)

March 2012 - May 2018

Advisor: Prof. C V Jawahar and Prof. Anoop Namboodiri

- **Person Recognition** with multiple body cues (head, upper body, etc.) published at (CVPR17, WACV20).
- **Face Detection** with bag-of-words retrieval framework published at ICCV15.
- **Face Recognition** in image collections (e.g. photo-albums) with self training technique that selects confident seed images from the target domain with off-the-shelf algorithms. We then apply transductive label propagation to transfer their labels to remaining images (ACPR13, ICPR14, SIVP17).
- **Large Scale Face Database:** Built a large face database for Indian subjects collected primarily from Indian movies. Managed the entire process working with a large team of annotators (NCVPRIPG13).
- **Document Image Restoration** with sparse coding technique (ICDAR13).
- **Music Classification.** Proposed a feature fusion strategy that combines information from pitch class profile and n-gram of pitch notes for Indian Raga Classification, and non-negative matrix decomposition technique multi-label classification of music (ICPR14, ICAPR15).

Software Engineer, Motorola Solutions, Bangalore

April 2010 - Feb 2012

Automation for LTE KPI measurement and release build sanity checks.

Software Internship, Motorola Solutions, Bangalore

Nov 2009 - Apr 2010

Automation to capture Wimax network events into detailed reports.

EDUCATION

Doctor of Philosophy, Computer Science

July 2012 - May 2018

Advisors: Prof. C V Jawahar and Dr. Anoop Namboodiri

PhD thesis: **Person identification in Images and Videos**

International Institute of Information Technology, Hyderabad, India

Bachelor of Engineering

Aug 2005 – July 2009

Electronics and Communication Engineering

R. V. College of Engineering, Bangalore, India.

SELECTED PUBLICATIONS

(For a complete list, please refer to [Google scholar](#) page.)

- Ambareesh R, Vijay Kumar, Deepthi Sharma, **Semi-supervised Learning for Fashion Compatability**, ACM RecSys, 2021.
- Vijay Kumar, Makarand Tapaswi, Ivan Laptev, **Spatio-Temporal Modeling with Graph Neural Networks for Action Detection**, Computer Vision and Image Understanding Journal (CVIU), 2021.
- Vijay Kumar, Anoop Namboodiri, C. V. Jawahar, **Region Pooling and Adaptive Feature Aggregation for End-to-End Person Recognition**, Winter Conference on Applications of Computer Vision (WACV), 2020.
- Vijay Kumar, Anoop Namboodiri, Manohar Paluri, C. V. Jawahar, **Pose-Aware Person Recognition**, International Conference on Computer Vision and Pattern Recognition (CVPR), 2017.
- Vijay Kumar, Anoop Namboodiri, C. V. Jawahar, **Visual Phrases for Exemplar Face Detection**, International Conference on Computer Vision (ICCV), 2015.
- Vijay Kumar, Anoop Namboodiri, C. V. Jawahar, **Semi-supervised Annotation of Faces in Image Collection**, Signal, Image and Video Processing, Springer, 2018.

TALKS AND TUTORIALS

- Pose-Aware Person Recognition, Amazon India AI Summit, Bangalore.
- People Recognition in Images and Videos, TCS Research, Pune.
- Tutorials on semi-supervised learning, sparse coding and its applications, CVIT, IIIT Hyderabad.

PROFESSIONAL SERVICE

- Conferences: Reviewer. WACV 2021, ACCV 2020, ECCV 2020, CVPR 2020, AAAI (2020-21), ICCV 2019, MIPR (2017-18), ICVGIP 2018.
- Journals: Reviewer. IEEE PAMI (2018, 2020), Springer IJCV (2018), IEEE Trans. Information Forensics and Security (2018).

SUPERVISION

- Himangi Saraogi, **Action Recognition in Soccer Videos**, 2016 (with Prof. C V Jawahar) (**ICVGIP 2016**).
- Hiba Ahsan, **Multi-label Annotation of Music**, 2014 (with Prof. C V Jawahar) (**ICAPR 2015**).
- Amit Bansal, Gautam Tulsian, **Document Image Restoration**, 2013 (with Prof. C V Jawahar) (**ICDAR 2013**).
- Shankar Shetty, Parisa Beham, Moula Husain, **Indian Movie Face Database**, 2013 (with Prof. C V Jawahar) (**NCVPRIPG 2013**).

GRANTS AND AWARDS

- TCS PhD Research Fellowship (2012 – 2017), TCS Travel Grant (ICCV 2015, Chile).
- Karnataka engineering entrance exam: Rank 114, Maths and Physics: 100/100.
- Best Outgoing student, High School, BBV Pragathinagar, 2005.

SOFTWARE SKILLS

Python, Matlab, Spark, PyTorch, OpenCV

REFERENCES

available upon request