Moneish Kumar

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Research Objective

To work as a researcher in the field of Computer Vision and Machine Learning. Create solutions that would have a lasting impact on the lives of people.

Education

International Institute of Information Technology, Hyderabad — Hyderabad, India

B.Tech. and MS by Research in Electronics and Communication Engineering, ***GPA: 8.33/10*** — July 2013 - Dec. 2018

Advisor : Dr Vineet Gandhi

Thesis : Computational Video Editing and Re-editing

Relevant Courses

- Operating Systems
- Data Structures and Algorithms
- Computer System Organisation
- Optimization Methods
- Digital Image Processing
- Computer Vision
- Machine Learning
- Statistical Methods in AI

Publications and Patents

- KL Bhanu Moorthy, **Moneish Kumar**, Ramanathan Subramanian, and Vineet Gandhi. **"GAZED–Gaze-guided Cinematic Editing of Wide-Angle Monocular Video Recordings."** In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, pp. 1-11. 2020.
- **Moneish Kumar***, Kranthi Kumar Rachavarapu*, Vineet Gandhi, and Ramanathan Subramanian. **"Watch to edit: Video retargeting using gaze."** In Computer Graphics Forum, vol. 37, no. 2, pp. 205-215. 2018.
- **Moneish Kumar**, Vineet Gandhi, Remi Ronfard, and Michael Gleicher. **"Zooming on all actors: Automatic focus+ context split screen video generation."** In Computer Graphics Forum, vol. 36, no. 2, pp. 455-465. 2017.
- Vineet Gandhi, **Moneish Kumar**, Remi Pierre Ronfard, and Michael Lee Gleicher. **"System and method for automatically generating split screen for a video of a dynamic scene."** U.S. Patent 10,084,970, issued September 25, 2018.

Honors and Awards

Samsung Effithon (Hackathon) runner-up — Sept. 2019

Ranked 2^{nd} amongst 130 teams, Samsung Research Institute-Banglore (SRI-B)

Professional Software Competency (SWC) Test — Dec. 2018

Cleared SWC for working professionals (one among the only 10% in SRI-B)

ACM-India and IARCS Travel grant — March 2018

Fully funded for presenting at Eurographics 18 conference

Research Award — April 2017

Published a good quality paper while being an undergraduate student, IIIT-H

Deans Merit List — 2014 & 2015

Awarded for excellence in studies and being in the top 5% during that year, IIIT-H

Work Experience

Research Engineer July 2018 – Present
Samsung Research Institute - Banglore, India *C++, Python, PyTorch, Java*

- Responsible for building on-device ML and Deep Learning solutions and development of native and Android code.
- Developed an extremely fast and accurate object detection and classification framework using MobileNet-Single Shot Detector (SSD) and an Inception-v3 based classifier. Overall pipeline required only 30ms to be run on device.
- Framework was selected for commercialization in Samsung's S10 galaxy and has been deployed in all flagships as part of Bixby Vision ever since. It has a total of 70 million users.
- Developed a novel Neural Network Architecture capable of attaching modules part-wise which allows for easier and lesser overhead during model updates in mobile phones.

Research Intern July 2017 – Sept. 2017
Inria Grenoble - Rhône-Alpes, France *Keras, python*

- Worked on Person Re-Identification in videos. Developed a modular pipeline that incorporated the traditional person detector with spatial and temporal constraints in an convex optimisation framework to produce more accurate person tracks.
- The pipeline was integrated as a module in an open-source compositor (Natron) to showcase its efficacy.

Teaching Assistant July 2015 – Dec 2016
International Institute of Information Technology, Hyderabad *Hyderabad, India*

- Teaching Assistant for three courses - *Mathematics I*, *Basic Electronics Circuits* and *Electrical Science 2*
- Responsibilities included conducting tutorial sessions, making assignments, and grading tests for classes with over 100 students.

Academic Projects

Video re-targeting using gaze | *Python, OpenCv, Matlab, Docker* July 2017 – March 2018

- Developed a novel video re-targeting algorithm by posing the problem two parts 1) detection of timestamps where new cuts can be introduced, 2) optimisation of the camera tracks to look more natural.
- The method was robust to any type of input video and **40 times** faster than the previous SOTA.

Split Screen Composition | *Matlab, OpenCv* Sept 2016 – March 2017

- Designed a dynamic Split Screen Composition for stage performances. Layouts could dynamically change depending on the relative position of performers on stage.
- A combination dynamic programming and convex optimisation was used to implement the solution.

Sports video analysis | *Python, OpenCV* Jan. 2016 – March 2016

- Developed a application that took as input a soccer video and provided various statistics for the same.
- Used various Computer Vision techniques such as, background subtraction, Hough transform, template matching temporal analysis.
- The method could successfully track the ball, track multiple players, determine ball possession by each player, detection of fouls/off-sides, and goals scored.

Locating cyclone shelter | *Matlab* July 2015 – Dec. 2015

- Created a framework which identified the potential location of a cyclone shelter within a geographical map by, taking into account the topographic maps, flood maps, road maps and population density.
- Tested the framework for many cities in the southern part of India.

Technical Skills

Languages: Python, C/C++, MATLAB, JavaScript, HTML/CSS
Frameworks: PyTorch, caffe, TensorFlow
Developer Tools: Git, Docker, VS Code, Visual Studio, IntelliJ, Eclipse
Libraries: NumPy, Matplotlib,pandas