

Gurkirt Singh

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INTERESTS	Computer Vision and Machine learning
EDUCATION	<p>PhD in Computing and Maths Sept'15 - present Artificial Intelligence and Vision research group, Oxford Brookes University Proposed thesis direction: <i>Online action detection and prediction in videos</i>. Supervisors: Professor Fabio Cuzzolin</p> <p>Research Master, Specialization: <i>Graphics Vision and Robotics</i> 2012 - 2013 ENSIMAG - Grenoble INP, France Grades: 13.74/20.00 Max Grades in class: 16.12/20.00 Thesis: <i>Frame-wise representations of depth videos for action recognition</i>. Supervisors: Professor. Radu Horaud and Dr. Georgios Evangelidis</p> <p>B.Tech. in Electronics and Instrumentation Engineering. 2006 - 2010 VIT University, Vellore, India; CGPA: 8.33/10.00 Thesis: <i>Categorising the Abnormal Behaviour from an Indoor Overhead Camera</i>. Supervisor: Professor Bob Fisher from University of Edinburgh, UK</p>
CONTESTS	<p>Charades-2017: Action Recognition and Segmentation tasks (Rank: 2/10 and 3/6) 2016 ActivityNet-2017: Classification tasks (Rank 3/29) 2016 ActivityNet-2016: Classification and Detection tasks (Rank 10/24 and 2/6) 2016 Chalearn Looking at People Challenge (Gesture Detection Task Rank 7/17) 2014 Chalearn Multi-Modal Gesture Recognition Challenge (Rank 17/54) 2013</p>
EXPERIENCE	<p>BorealisAI, Vancouver, Canada Feb'19 - May'19 Research Intern, Computer Vision <i>Human Object Interaction Detection in Videos</i>. Supervisors: Leonid Sigal and Greg Mori</p> <p>Disney Research Pittsburgh, USA Feb'17 - July'17 Research Intern, Computer Vision <i>Temporal Activity Detection in untrimmed videos of TV-episodes</i>. Supervisors: Leonid Sigal and Andreas Lehrmann</p> <p>Siemens Corporate Research and Technology, India Oct'13 - Aug'15 Research Engineer, Imaging and Computer Vision group <i>Multiple Object detection and tracking for video surveillance applications</i> Collaborator: Siemens Corporate Research, Princeton, USA</p> <p>Perception team, INRIA Grenoble, France Research Engineer: <i>Multi-modal gesture recognition</i>. June'13 - Sept'13 Master thesis: <i>Frame-wise representations of depth videos</i>. Jan'13 - May'13 Supervisors: Dr. Georgios Evangelidis and Dr. Radu Horaud</p> <p>University of Edinburgh, UK Jan'10 - May'10 Intern at Institute of Perception, Action and Behaviour Title: <i>Categorising the Abnormal Behaviour from an Indoor Overhead Camera</i>. Supervisor: Dr. Bob Fisher</p>

Vision and Graphics lab IIT Delhi, India

May'11 - March'12

Project Associate, *Implementation of Interactive Single View Image Based Model Reconstruction*. AND. *Moving object detection with moving camera*.

Supervisors: Dr. Subhashis Banerjee

SMSS lab, IIT Kanpur, India

June'10 - March'11

Project Associate, *Control of Reconfigurable Parabolic Antenna using SMA actuators*.

Supervisors: Dr. Bishakh Bhattacharya

PUBLICATIONS **Gurkirt Singh** and Fabio Cuzzolin, *Recurrence to the Rescue: Towards Causal Spatiotemporal Representations*, arXiv: 1811.07157 (2018).

Gurkirt Singh, Suman Saha and Fabio Cuzzolin, *Predicting Action Tubes*, in AHB2018 workshop at ECCV 2018.

Gurkirt Singh, Suman Saha and Fabio Cuzzolin, *TraMNet - Transition Matrix Network for Efficient Action Tube Proposals*, ACCV, Perth, 2018.

Gurkirt Singh*, Stephen Akrigg*, Valentina Fontana*, Manuele Di Maio, Suman Saha, Fabio Cuzzolin, *Action Detection from a Robot-Car Perspective*, preprint arXiv: 1807.11332 * means equal contribution

Gurkirt Singh, Suman Saha, Michael Sapienza, Philip Torr and Fabio Cuzzolin, *Online Real-time Multiple Spatiotemporal Action Localisation and Prediction*, ICCV, 2017. **54** citations.

Suman Saha, **Gurkirt Singh** and Fabio Cuzzolin, *AMTnet: Action-Micro-Tube Regression by end-to-end Trainable Deep Architecture*, ICCV, 2017. **22** citations.

Harkirat Behl, Michael Sapienza **Gurkirt Singh**, Suman Saha, Fabio Cuzzolin and Philip Torr, *Incremental Tube Construction for Human Action Detection*, BMVC, 2018. **1** citations.

Suman Saha, **Gurkirt Singh**, Michael Sapienza, Philip Torr and Fabio Cuzzolin, *Spatio-temporal human action localisation and instance segmentation in temporally untrimmed videos*, arXiv, 2017.

Suman Saha, **Gurkirt Singh**, Michael Sapienza, Philip Torr and Fabio Cuzzolin, *Deep Learning for Detecting Multiple Space-Time Action Tubes in Videos*, in BMVC 2016, **71** citations.

Gurkirt Singh and Fabio Cuzzolin, *Untrimmed Video Classification for Activity Detection: Submission to ActivityNet Challenge*, arXiv: 1607.01979 (2016), **2nd** position in Activity Detection challenge at ActivityNet workshop CVPR 2016, **33** citations.

Georgios Evangelidis, **Gurkirt Singh**, Radu Horaud, *Continuous Gesture Recognition from Articulated Poses*, in ChalearnLAP2014 workshop at ECCV 2014. **36** citations.

Georgios Evangelidis, **Gurkirt Singh**, Radu Horaud, *Skeletal Quads: Human action recognition using joint quadruples*, in ICPR 2014 Stockholm. **171** citations.

THESIS

Master's thesis, *Frame-wise Representations of Depth Videos for Action Recognition*. We investigate the of problem continuous action recognition from depth images. Three

types of depth frame data representation are proposed. Further, we investigate the frame-wise classification as a solution for the continuous action detection problem.

Bachelor's thesis *Categorising the Abnormal Behaviour from an Indoor Overhead Camera*. We propose an approach of using an overhead camera to detect the anomalous events based on the trajectories of moving objects with and EER (Equal Error rate) of only 1.2%. I contributed 65000 trajectories to *Edinburgh Informatics Forum Pedestrian Database*.

SKILLS

Programming: Python, Matlab, C/C++, Lua.

Deep Learning Platforms: Torch, PyTorch, Theano, Caffe.

Libraries: OpenCV, Eigen, Scikit-Learn, Numpy, Scipy, Kinect SDK, OpenNI.

Operating Systems: Linux and Windows.

Development Environments: Visual Studio, Eclipse, GCC, Spyder, Pycharm.

LANGUAGES

Punjabi (Maternal), Hindi (Fluent), English (Fluent), French (Elementary)

REFEREES

Professor Fabio Cuzzolin, Oxford Brookes University, UK.

Professor Philip Torr, University of Oxford, UK.

Professor Bob Fisher, University of Edinburgh, UK.

Professor Radu Patrice HORAUD, INRIA, Grenoble, France.

Dr. Leonid Sigal, Disney Research Pittsburgh, USA.

Dr. Andreas Lehrmann, Disney Research Pittsburgh, USA.

Dr. Georgios EVANGELIDIS; Daqri, USA.

Dr. Amit Kale, Bosch Research, India.

MISC

Attended International Computer Vision Summer school, Sicili, 2016, was part of winning reading group.