

Gurkirt Singh

Xovis AG – Bern, Switzerland

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Experience Academia: 4+ years, Industry 4+ years

Xovis AG, Bern, CH, *Senior ML & CV Engineer*

Since Oct 23, 2 years

Distillation: Led the design and development of model distillation pipeline.

– Distilled Transformer models (ViT) to embedded deployment friendly models.

Object Detection: Spearheaded the design and development of multi-task object detection and tracking models.

– Achieved three times reduction in false positive rate.

Quantization: Engineered QAT for WinogradConvs to enable deployment on 250K+ embedded devices with FPGA.

Auto-labeling: Led efforts to optimize and semi-automate the labeling pipeline.

Multi-modal foundation models: Implemented SSL techniques to train multi-modal foundation models using large quantities of unlabeled videos.

ETH, Zurich, CH, *Postdoctoral Fellow*

Feb 20, 3.5 years

Responsible for research support for startups with problems such as monocular depth estimation, 3D reconstruction, 3D human pose estimation, and MRI classification.

BorealisAI, Vancouver, CA, *Research Intern*

Feb 19, 4 months

Developed human-object relation detection algorithm for videos.

Disney Research, Pittsburgh, US, *Research Intern*

Feb 17, 6 months

Developed action-detection method for meta-data generation of ABC's tv-episodes.

Siemens Research, Bangalore, IN, *Research Engineer*

Oct 13, 2 years

Supported research team with implementation of algorithms such as optical-flow and object-tracking.

INRIA, Grenoble, FR, *Research Intern*

Feb 13, 8 months

Researched gesture recognition methods for RGB-D cameras.

University of Edinburgh, UK, *Research Intern*

Jan 10, 4 months

Worked on anomalous trajectory detection with GMMs.

Education

Oxford Brookes University, UK *PhD Computer Vision*

Sep 15, 4 years

ENSIMAG, INP, Grenoble, FR *MSc Informatics*

Sep 12 - 1.2 years

VIT University, Vellore, IN *B.Tech Electronics*

Aug 06 - 4 years

Selected Publications 18+ in TPAMI, ICCV, CVPRW, ECCVW, WACV, ACCV, BMVC, ICPR

Gurkirt Singh, Vasileios Choutas, Suman Saha, Fisher Yu, Luc Van Gool, **Spatio-Temporal Action Detection Under Large Motion**, *IEEE/CVF Winter Conference on Applications of computer Vision (WACV)*, 2023

Gurkirt Singh, Stephen Akrigg, Manuele Di Maio, others &, Fabio Cuzzolin, **ROAD: The ROad Event Awareness Dataset for Autonomous Driving**, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 2022

Suman Saha, **Gurkirt Singh**, Michael Sapienza, Philip HS Torr, Fabio Cuzzolin **Spatio-Temporal Action Instance Segmentation and Localisation** *Book Chapter: Modelling Human Motion*, 2020

Gurkirt Singh and Fabio Cuzzolin, **Recurrent Convolutions for Causal 3D CNNs**, *Workshop on Large Scale Holistic Video Understanding, ICCV*, 2019

Silvio Olivastri, **Gurkirt Singh** and Fabio Cuzzolin, **An End-to-End Baseline for Video Captioning**, *Workshop on Large Scale Holistic Video Understanding, ICCV*, 2019

Gurkirt Singh, Suman Saha and Fabio Cuzzolin, **TraMNet - Transition Matrix Network for Efficient Action Tube Proposals**, *Asian Conference on Computer Vision (ACCV)*, 2018

Gurkirt Singh, Suman Saha, Michael Sapienza, Philip Torr and Fabio Cuzzolin, **Online Real-time Multiple Spatiotemporal Action Localisation and Prediction**, *International Conference on Computer Vision (ICCV)*, 2017

AMTnet: Action-Micro-Tube Regression by end-to-end Trainable Deep Architecture, Suman Saha, **Gurkirt Singh** and Fabio Cuzzolin, *International Conference on Computer Vision (ICCV)*, 2017

Suman Saha, **Gurkirt Singh**, Michael Sapienza, Philip Torr and Fabio Cuzzolin, **Deep Learning for Detecting Multiple Space-Time Action Tubes in Videos**, *British Machine Vision Conference (BMVC)*, 2016

Georgios Evangelidis, **Gurkirt Singh**, Radu Horaud, **Skeletal Quads: Human action recognition using joint quadruples**, *International Conference on Pattern Recognition Vision (ICPR)*, 2014

Awards & Challenges

Multisports-Challenge, DeeperAction ECCV'22: Winner of Action Detection Track	2022
Doctoral Consortium: Selected for Doctoral Consortium Award ICCV-2019	2019
Best Reviewer: Selected as the best reviewer for ICCV-2019	2019
PhD Scholarship: 150th Anniversary PhD Scholarship, Oxford Brookes University	2015
Charades-Challenge 2017: Action Recognition and Segmentation tasks (Rank: 2/10 and 3/6)	2017
ActivityNet-Challenge 2017: Classification tasks (Rank 3/29)	2017
ActivityNet-Challenge 2016: Classification and Detection tasks (Rank 10/24 and 2/6)	2016
Chalearn-Challenge 2014: Looking at People Challenge (Gesture Detection Task Rank 7/17)	2014

Skills

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

Deep Learning Platforms: PyTorch, JAX, Torch, Caffe, TensorFlow, Keras

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

Operating Systems: Linux, macOS, Windows

Teaching Experience

Machine Learning: Teaching Assistant (Postgraduate)	2018
Computer Vision and Machine Learning: Guest lecturer (Postgraduate)	2016, 2017, 2018
Understanding Programming: Lab Assistant (Undergraduate)	2015, 2016, 2017

Community Contributions

Co-organized workshop on The ROAD Challenge ICCV 2023.

Co-organized workshop on The ROAD Challenge ICCV 2021.

Co-organized workshop on ESAD challenge for surgeon action detection, MIDL 2020.

Best reviewer award ICCV 2019

Reviewer: TPAMI 2017, 2018, ICCV 2019, 2021, ECCV 2020, 2022 CVPR 2018,2019,2020,2021,2022
BMVC 2018,2019 and IJCI 2017, 2018, 2019

Languages

English (C1), German (A2) Punjabi (Maternal), Hindi (Maternal)

References

Professor Luc Van Gool, ETH Zurich, Switzerland.

Professor Fabio Cuzzolin, Oxford Brookes University, UK.

Professor Leonid Sigal, University of British Columbia, Canada.

Professor Philip Torr, University of Oxford, UK.

Dr. Georgios Evangelidis; Snap, Vienna, Austria.

Dr. Andreas Lehrmann, BorealisAI, Vancouver, Canada.

Professor Bob Fisher, University of Edinburgh, UK.

Dr. Amit Kale, Bosch Research, India.

More Information

Google Scholar: <https://scholar.google.com/citations?user=w8XHUMIAAAAJ&hl=en>

Homepage: <http://gurkirt.github.io/>

Github: <https://github.com/gurkirt>

LinkedIn: <https://www.linkedin.com/in/gurkirt/>