Mamshad Nayeem Rizve

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EDUCATION

Center for Research in Computer Vision, University of Central Florida
PhD in Computer Science — *August 2023*
MS in Computer Science — *December 2022*
Research areas: Semi-Supervised Learning, Few-Shot Learning, Self-Supervised Learning

Bangladesh University of Engineering and Technology
BSc in Electrical and Electronic Engineering — *March 2016*

EXPERIENCE

Postdoctoral Scientist, Amazon Search Science AI — *August 2023–Present*

- Working at the intersection of video understanding and large language models.

Graduate Research Assistant, Center for Research in Computer Vision — *August 2018–August 2023*

- Worked on video activity detection. Performed localization and classification of actions from untrimmed video sequences on a multi-label and multi-class dataset. Achieved *first* place in ActEV SDL 2020 challenge (ActivityNet Challange, CVPR-2020) and *second* position in TRECVid 2019 challenge.
- Worked on incorporating visual odometry based relative motion for improving cross-view video geo-localization.
- Worked on recognition of camera trapped animals from a highly imbalanced dataset.

Research Intern, Microsoft — *May 2022–July 2022*

- Worked on weakly supervised temporal action localization (WTAL) and proposed the first method to approach WTAL from a *l*ocalization-by-localization perspective by generating pseudo-action snippets.
- Proposed to exploit the underlying spatio-temporal regularities in videos in the form of action-specific scene prior, action snippet generation prior, and learnable Gaussian prior to complement the video-level weak supervision.
- Obtained significant improvement over previous state-of-the-art on multiple benchmark datasets.

Software Engineering Intern, Aurora Innovation — *May 2021–August 2021*

- Worked on emergency-vehicle detection based on siren audio data.
- Created an emergency-vehicle siren dataset and implemented the baseline and state-of-the-art audio classification methods for emergency-vehicle detection.
- Improved over the state-of-the-art methods by incorporating self-supervision and knowledge distillation.

System Engineer, Grameenphone Limited — *September 2016–July 2018*

- Supervised and monitored a transmission network consisting of more than 15000 nodes.
- Developed an analytical tool to identify microwave links with line of sight problem based on received signal level.
- Member of one of the finalist teams of Telenor Group's global entrepreneurship program.

SELECTED PUBLICATIONS

- Sirnam Swetha, **Mamshad Nayeem Rizve**, Nina Shvetsova, Hilde Kuehne, Mubarak Shah; **Preserving Modality Structure Improves Multi-Modal Learning**; International Conference on Computer Vision **(ICCV)** 2023
- Sarinda Samarasinghe, **Mamshad Nayeem Rizve**, Navid Kardan, Mubarak Shah; **CDFSL-V: Cross-Domain Few-Shot Learning for Videos**; International Conference on Computer Vision **(ICCV)** 2023
- Sabbir Ahmed*, Abdullah Al Arafat*, **Mamshad Nayeem Rizve***, Rahim Hossain, Zhishan Guo, Adnan Siraj Rakin; **SSDA: Secure Source-Free Domain Adaptation**; International Conference on Computer Vision **(ICCV)** 2023

- **Mamshad Nayeem Rizve***, Gaurav Mittal*, Ye Yu, Matthew Hall, Sandra Sajeev, Mubarak Shah, Mei Chen; **PivoTAL: Prior-Driven Supervision for Weakly-Supervised Temporal Action Localization**; Conference on Computer Vision and Pattern Recognition **(CVPR)** 2023
- Ishan Dave, **Mamshad Nayeem Rizve**, Chen Chen, Mubarak Shah; **TimeBalance: Temporally-Invariant and Temporally-Distinctive Video Representations for Semi-Supervised Action Recognition**; Conference on Computer Vision and Pattern Recognition **(CVPR)** 2023
- **Mamshad Nayeem Rizve**, Navid Kardan, Mubarak Shah; **Towards Realistic Semi-Supervised Learning**; European Conference on Computer Vision **(ECCV)** 2022 (Oral Presentation)
- **Mamshad Nayeem Rizve**, Navid Kardan, Salman Khan, Fahad Shahbaz Khan, Mubarak Shah; **OpenLDN: Learning to Discover Novel Classes for Open-World Semi-Supervised Learning**; European Conference on Computer Vision **(ECCV)** 2022
- Nazmul Karim, **Mamshad Nayeem Rizve**, Nazanin Rahnavard, Ajmal Mian, Mubarak Shah; **UNICON: Combating Label Noise Through Uniform Selection and Contrastive Learning**; Conference on Computer Vision and Pattern Recognition **(CVPR)** 2022
- Ishan Dave, Rohit Gupta, **Mamshad Nayeem Rizve**, Mubarak Shah; **TCLR: Temporal Contrastive Learning for Video Representation**; Computer Vision and Image Understanding **(CVIU)** 2022
- **Mamshad Nayeem Rizve**, Salman Khan, Fahad Shahbaz Khan, Mubarak Shah; **Exploring Complementary Strengths of Invariant and Equivariant Representations for Few-Shot Learning**; Conference on Computer Vision and Pattern Recognition **(CVPR)** 2021
- **Mamshad Nayeem Rizve**, Kevin Duarte, Yogesh S Rawat, Mubarak Shah; **In Defense of Pseudo-Labeling: An Uncertainty-Aware Pseudo-Label Selection Framework for Semi-Supervised Learning**; International Conference on Learning Representations **(ICLR)** 2021
- **Mamshad Nayeem Rizve**, Ugur Demir, Praveen Tirupattur, Aayush Jung Rana, Kevin Duarte, Ishan Dave, Yogesh Singh Rawat, Mubarak Shah; **Gabriella: An Online System for Real-Time Activity Detection in Untrimmed Security Videos**; International Conference on Pattern Recognition **(ICPR)** 2020 (Best Paper Award)
- Yogesh S Rawat, Mubarak Shah, Aayush Jung Rana, Praveen Tirupattur, **Mamshad Nayeem Rizve**; **Methods of Real-Time Spatio-Temporal Activity Detection and Categorization from Untrimmed Video Segments**; US Patent 11468676

SELECTED ACADEMIC PROJECTS

- **Semantic Segmentation**
  - Proposed Patch-Dice loss to address severe intra-class scale variance.
  - Worked on the MS COCO dataset and implemented *DeepLabv3+*.
- **Unsupervised Keypoint Detection**
  - Implemented *Unsupervised Learning of Object Landmarks through Conditional Image Generation*.
  - Incorporated a feature denoising block to improve the performance.
- **Video Object Segmentation**
  - Incorporated self-attention blocks, feature pyramid network and atrous convolution to improve VOS.
  - Implemented the method proposed in *YouTube-VOS: Sequence-to-Sequence Video Object Segmentation*.
- **Person Re-Identification**
  - Incorporated CycleGAN based camera style transfer to learn camera invariant features.
  - Proposed a segmentation mask guided identity loss to retain ID specific features in style transferred images.

SKILLS

Programming	Python, MATLAB, C/C++, Assembly, SQL
Libraries	Deep learning (Pytorch, Keras, Tensorflow), OpenCV

HONORS AND AWARDS

- Best Paper Award at ICPR –2020
- UCF ORC Doctoral Fellowship – 2018
- BUET Dean's List – 2012, 2015
- Education Board Scholarship – 2008, 2010