ALOK SINGH

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Research Interests

Natural Language Generation, Video Captioning, Image Captioning, Image Processing, and Video Shot Boundary Detection.

Educational Qualification

National Institute of Technology, Silchar **2019 - 2022**
PhD, Department of CSE **Advisor:** Dr Thoudam Doren Singh and Prof. Sivaji Bandyopadhyay

National Institute of Technology, Silchar **2017-2019**
M.Tech, Department of CSE (8.88 cgpa) **Advisor:** Dr Dalton Meitei Thounaojam

Uttarakhand Technical University, India **2013-2017**
B.Tech, College of Engineering Roorkee (73.35%)

Work Experience

Research Associate in Machine Learning and Data Science **University of Oxford**
(Sustainable finance group, SSEE) **Nov 2022-current**

Research Activities

Sustainable Finance Group, SSEE University of Oxford **Nov 2022-current**
Supervisors: Dr Ben Caldecott and Dr Steven Reece

Research goal: Asset Ownership: Mapping Asset level data to companies using Natural language processing and computer vision. It involved the extraction of information from different sources using natural language processing and location with the help of satellite images.

Centre for Natural Language Processing, NIT Silchar, India **July, 2019-current**
Supervisors: Dr Thoudam Doren Singh and Prof.Sivaji Bandyopadhyay

Research goal: Visual Description Generation: bridging a gap between vision and natural language.
The research aims to generate a short natural language description of the action and events occurring in an Image or Video.

Computer Vision Lab, NIT Silchar, India **July 2017-2019**
Supervisor: Dr Dalton Meitei Thounaojam
Research goal: Temporal Shot Boundary Detection in the presence of illumination and motion effect in a video.
The research aimed to detect abrupt boundaries in a video under illumination and motion effect effectively and efficiently.

Academic Activities

Workshop Reviewing: ALVR2020 (ACL2020), ALVR2021 (NAACL-2021), MMTLRL2021 (RANLP-2021)

Journals: Multimedia Tools and Applications, Applied Intelligence, Applied Artificial Intelligence, Imaging Science Journal, Expert Systems With Applications

Conference: ICON-2021, ICICSA2023

Talks/Tutorials:

- Presented a tutorial on Asset Ownership: Mapping Asset level data to companies using NLP at the Natural Language Processing for Sustainable Finance Programme Symposium (University of Oxford). [Online Presentation!]

- Presented a tutorial on "*Visual Description Generation: Fusion of Vision and Natural Language"* in Recent Advance in Machine Translation (RAMT-2021) a workshop organised by NIT Silchar. [Online Presentation!]

Technical Skills:

Programming Language: Python, MATLAB, C.
Framework & Tools: Keras, Pytorch, Tensorflow, Quantum GIS.
Data Analysis: Scikit-learn, NLTK, OpenCv

Publications

Journal Papers

1. Meetei, L. S., **Singh, A**., Singh, T. D., & Bandyopadhyay, S. (2023). Does cues in a video help in handling rare words in a machine translation system under a low-resource setting? *Natural Language Processing Journal*, 100016.

2. **Singh, Alok,** Thoudam Doren Singh, and Sivaji Bandyopadhyay. "V2t: video to text framework using a novel automatic shot boundary detection algorithm." *Multimedia Tools and Applications* 81.13 (2022): 17989-18009.

3. **Singh, A.,** Singh, T.D. & Bandyopadhyay, S. An encoder-decoder based framework for Hindi image caption generation. *Multimed Tools Appl* (2021). https://doi.org/10.1007/s11042-021-11106-5 (SCIE, IF 2.757)

4. **Singh, A.**, Singh, T.D. & Bandyopadhyay, S. Attention based video captioning framework for Hindi. *Multimedia Systems* (2021). https://doi.org/10.1007/s00530-021-00816-3 (SCI, IF-1.935)

5. Chakraborty, S., **Singh, A.**& Thounaojam, D.M. A novel bifold-stage shot boundary detection algorithm: invariant to motion and illumination. *Vis Comput* (2021). https://doi.org/10.1007/s00371-020-02027-9 (SCI, IF -2.601)

6. **Singh, A.**, Thounaojam, D. M., & Chakraborty, S. (2019). *A novel automatic shot boundary detection algorithm: robust to illumination and motion effect*. Signal, Image and Video Processing, 1-9. (SCI, IF 2.157). [Code!]

Conference Papers

1. Singh, S. M., Meetei, L. S., **Singh, A**., Das, R., Singh, T. D., & Bandyopadhyay, S. (2023). VATEX2020: pLSTM framework for video captioning. *Procedia Computer Science*, *218*, 1229-1237.

2. Meetei, L. S., **Singh, A**., Singh, S. M., Das, R., Singh, T. D., & Bandyopadhyay, S. "Hindi to English Multimodal Machine Translation on News Dataset in Low Resource Setting." *Procedia Computer Science* 218 (2023): 2102-2109.
3. **Singh, A.,** Meetei, L. S., Singh, S.M., Singh, T.D., & Bandyopadhyay, S. An efficient keyframes selection based framework for video captioning. *In Proceedings of the International Conference on Natural Language Processing ICON-2021*

4. Meetei, L. S., Singh, S.M., **Singh, A.,** Singh, T.D., & Bandyopadhyay, S. An Experiment on Speech-to-Text Translation Systems for Manipuri to English on Low Resource Setting. *In Proceedings of the International Conference on Natural Language Processing ICON-2021*

5. Singh, S.M., Meetei, L. S., **Singh, A.,** Singh, T.D., & Bandyopadhyay, S. On the Transferability of Massively Multilingual Pretrained Models in the Pretext of the Indo-Aryan and Tibeto-Burman Languages. *In Proceedings of the International Conference on Natural Language Processing ICON-2021*

6. **Singh, A.**, Meetei, L.S., Singh, T.D., & Bandyopadhyay, S. *Generation and Evaluation of Hindi Image Captioning of Visual Genome.* In Proceedings of I3CS 2021 *https://doi.org/10.1007/978-981- 33-4084-8_7*.

7. Chakraborty, S., Thounaojam, D.M., **Singh, A.**, Pal, G., *ALO-SBD: A Hybrid Shot Boundary Detection Technique for video surveillance System.* In Proceedings of ADCOM 2020 (Accepted Rank- B)

8. De, P. K., Pankaj, and **Alok Singh**. *"A Study of Propagation of Love Waves in an Anisotropic Porous Layer Under Initial Stress."* Recent Trends in Applied Mathematics: Select Proceedings of AMSE 2019. Springer Singapore, 2021.

Workshop Papers/ Invited Papers/Preprints/Shared Task:

1. **Singh, A.,** Singh, T. D., & Bandyopadhyay, S. (2020).*A Comprehensive Review on Recent Methods and Challenges of Video Description***.** *arXiv preprint arXiv:2011.14752*.

2. **Singh, A.**, Singh, T.D., & Bandyopadhyay, S. (2020). *NITS-VC system for VATEX Video Captioning Challenge 2020*. Invited Paper in workshop LVVU CVPR 2020 *arXiv preprint arXiv:2006.04058*(2020). [Online Presentation!]

3. **Shared Task**: VATEX Video captioning - In conjunction with CVPR 2020 [Result!]

4. **Ranked first in MSU** Shot Boundary Detection Benchmark 2020 challenge organised by Lomonosov MSU Graphics & Media Lab.**Team name: NITS-CV-Lab-v1.0** [Results!][Code!]

Datasets:

1. MSR-VTT Hindi video description dataset
   - Available at: [alokssingh/MSR-VTT-Hindi-video-captioning: This repository contains the MSR-VTT video captioning dataset in Hindi.]
   - Baseline model: https://github.com/alokssingh/RMN-MSR-VTT-Hindi-VC

Codes/Contact Details

1. Github: https://github.com/alokssingh
2. Website: Alok Singh
3. LinkedIn: https://www.linkedin.com/in/alokssingh/
4. Google Scholar: https://scholar.google.com/citations?user=K6ecfUwAAAAJ&hl=en
5. ResearchGate: https://www.researchgate.net/profile/Alok-Singh-97

Referees

- **Dr Steven Reece:** Head of Machine Learning Research and Data Science, Oxford Sustainable Finance Group
  Email: steven.reece@smithschool.ox.ac.uk
  Profile: https://www.smithschool.ox.ac.uk/person/dr-steven-reece

- **Dr Thoudam Doren Singh:** Assistant Professor in the Computer Science and Engineering Department at NIT Silchar, India.
  Email: thoudam.doren@gmail.com, doren@cse.nits.ac.in
  Profile: http://cs.nits.ac.in/doren/

- **Prof. Sivaji Bandyopadhyay:** Director of National Institute of Technology Silchar and Professor in the Department of Computer Science and Engineering at Jadavpur University.
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  Profile: http://www.jaduniv.edu.in/profile.php?uid=2

- **Dr Dalton Meitei Thounaojam:** Assistant Professor in the Computer Science and Engineering Department at NIT Silchar, India.
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  Profile: http://cs.nits.ac.in/dalton/