ROBIK SHRESTHA

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RESEARCH INTERESTS

Artificial Intelligence, Deep Learning, Bias and Fairness, Computer Vision, Natural Language Processing (NLP), Vision & Language and Lifelong Machine Learning

EDUCATION

Aug 2017 - CURRENT	Ph.D. in IMAGING SCIENCE Chester F. Carlson Center for Imaging Science Rochester Institute of Technology, Rochester, NY **Advisor:** Dr. Christopher Kanan | **Research Group:** kLab
OCT 2008 - DEC 2012	B.E. in COMPUTER ENGINEERING Institute of Engineering, Tribhuvan University, Nepal Full Merit-Based Scholarship, Obtained 1st rank **Relevant Courses:** Image Processing and Pattern Recognition, Artificial Intelligence

WORK AND RESEARCH EXPERIENCE

2017 - (expected: Spring 2023)	**Ph.D. Student/Graduate Research Assistant** *kLab, Chester F. Carlson Center for Imaging Science, RIT* **Highlights:** As a Ph.D. student, I have 8+ publications on vision and multimodal (vision+language) models. My current research focuses on improving the bias-resistance of deep learning systems through concept grounding and multiple hypothesis generation
2021	**Research Intern** *Adobe Inc (Remote)* **Highlights:** Focused on improving vision and language embeddings to encode *fine-grained concepts*. Experimented with *contrastive learning methods* under algebraic constraints to learn richer concept representations. Also, worked on collecting *hard negative image-caption pairs* to test object, attribute, relation sensitivity. **Mentors:** Dr. Kushal Kafle, Dr. Scott Cohen, Dr. Zhe Lin

Spring 2018	**TEACHING ASSISTANT** *Chester F. Carlson Center for Imaging Science, RIT* **Highlights:** Collaborated with the course instructor Dr. Guoyu Lu to teach and assess graduate students for the course of *MultiView Geometry.*
2018 - 2019	**RESEARCH ASSISTANT** *ITEL Laboratories, Florida* (in collaboration with RIT) **Highlights:** Built a floor material classification system to handle loss claims. Mitigated reliance on *dataset biases***,** improved *model calibration* and worked on *out-of-distribution detection* to enable semi-automated processing of the claims.
2014 - 2016	**LEAD DEVELOPER** *Viveka Health LLC, Nepal* **Highlights:** Worked on a fraud detection engine for U.S. health insurance claims that saved *$1M+* for *25K+ lives* through various employers and payers. Developed a rules engine system to process insurance claims to identify areas of *fraud, waste and abuse*.
2012 - 2014	**SOFTWARE ENGINEER** *Yomari Incorporated, Nepal* **Highlights:** Developed business intelligence solutions for Nepal Telecom and international retailers. Involved in data warehousing and data mining projects.

PUBLICATIONS

ECCV (**Oral**) (2022)	**Robik Shrestha,** Kushal Kafle, Christopher Kanan. "OccamNets: Mitigating Dataset Bias by Favoring Simpler Hypotheses." *European Conference on Computer Vision (2022)*
WACV (2022)	**Robik Shrestha,** Kushal Kafle, Christopher Kanan. "An investigation of critical issues in bias mitigation techniques." *IEEE/CVF Winter Conference of Applications on Computer Vision* (2022)
Frontiers (2022)	Usman Mahmood, **Robik Shrestha** et al. "Detecting Spurious Correlations With Sanity Tests for Artificial Intelligence Guided Radiology Systems." *Frontiers in Digital Health (2022)*
NeurIPS (2020)	Damien Teney, Kushal Kafle, **Robik Shrestha** et al. "On the Value of Out-of-Distribution Testing: An Example of Goodhart's Law." *Neural Information Processing Systems (2020)*
ECCV (2020)	Tyler Hayes*, Kushal Kafle*, **Robik Shrestha***, Manoj Acharya and Christopher Kanan. "REMIND Your Neural Network to Prevent Catastrophic

	Forgetting." *European Conference on Computer Vision* (2020). (* = equal contributions)
ACL (2020)	**Robik Shrestha,** Kushal Kafle, and Christopher Kanan. "A negative case analysis of visual grounding methods for VQA." *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics* (2020).
WACV (2020)	Kushal Kafle, **Robik Shrestha**, and Christopher Kanan "Answering questions about data visualizations using efficient bimodal fusion." *The IEEE Winter Conference on Applications of Computer Vision* (2020).
CVPR (2019)	**Robik Shrestha**, Kushal Kafle, and Christopher Kanan. "Answer them all! toward universal visual question answering models." *Proceedings of the IEEE conference on computer vision and pattern recognition* (2019).
Frontiers (2019)	Kushal Kafle, **Robik Shrestha**, and Christopher Kanan. "Challenges and prospects in vision and language research." *Frontiers in Artificial Intelligence* (2019).

INVITED TALKS AND GUEST LECTURES

Fall 2021	***"Dataset Bias in Vision and Language Tasks: Problems and Potential Solutions"*** *for Center for Human Aware AI (CHAI)* Rochester, NY
2020 and 2021	***"An Introduction to Bias Mitigation Techniques"*** *for the Deep Learning course taught by Dr. Christopher Kanan* Rochester Institute of Technology, Rochester, NY

TECHNICAL SKILLS

- **Programming (Proficient):** Python
- **Frameworks/Tools:** PyTorch, Pytorch-Lightning, Numpy, Scipy, Scikit-Learn, Pandas, MTurk
- **Others:** Tensorflow, Shell Scripting, AWS, Matlab, C/C++/Java, Javascript, D3.js, Git, LateX

REVIEWING EXPERIENCE

- Neural Information Processing System (NeurIPS) **2022**
- IEEE/CVF Winter Conference of Applications on Computer Vision (WACV) **2021**
- Association for the Advancement of Artificial Intelligence (AAAI) **2019/20**
- Conference on Empirical Methods in Natural Language Processing (EMNLP) **2019/20**

- European Association for Computational Linguistics (EACL) **2020**
- IEEE Transactions on Circuits and Systems for Video Technology (ICSVT) **2020**
- Natural Language Engineering (NLE) **2019**