Kushal Kafle

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Research Interests

Deep Learning, Computer Vision, Natural Language Processing (NLP), Visual Question Answering (VQA), Integration of Vision & Language, Interpretability and Bias in Deep Learning

Education

Aug 2014 - 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 **Thesis Title**: Towards language-grounded visual learning
Oct 2008 - Dec 2012	**B.E. in ELECTRONICS & COMMUNICATION ENGINEERING**, Institute of Engineering, Tribhuvan University, Nepal **Elective Specialization**: Image Processing and Pattern Recognition

Publications

WACV	**Kafle, K.**, Shrestha, R., Price, B., Cohen, S., and Kanan, C. (2019). Answering Questions about Data Visualizations using Efficient Bimodal Fusion. *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2020)*.
arXiV	**Kafle, K.**, Shrestha, R. and Kanan, C. (2019). Challenges and Prospects in Vision and Language Research. *Under Review, available in arXiV (2019))*.
CVPR	Shrestha, R., **Kafle, K.**, and Kanan, C. (2018). Answer Them All! Toward Universal Visual Question Answering Models. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2019)*.
AAAI	Acharya, M., **Kafle, K.**, and Kanan, C. (2018). TallyQA: Answering Complex Counting Questions. *Association for the Advancement of Artificial Intelligence (AAAI 2018)*.
CVPR	**Kafle, K.**, Cohen, S., Price, B., and Kanan, C. (2018). DVQA: Understanding Data Visualizations via Question Answering. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2018)*.
ICCV	**Kafle, K.** and Kanan, C. (2017) An analysis of visual question answering algorithms. *International Conference on Computer Vision ((ICCV 2017))*.
CVIU	**Kafle, K.** and Kanan, C. (2017) Visual question answering: Datasets, algorithms, and future challenges. *Computer Vision and Image Understanding (CVIU)*.

INLG	**Kafle, K.**, Yousefhussein, M., and Kanan, C.. (2017) Data augmentation for visual question answering. *International Natural Language Generation Conference (INLG 2017)*.
CVPR	**Kafle, K.** and Kanan, C. (2016) Answer-type prediction for visual question answering. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2016)*.

Research Experience

May 2019- Aug 2019	**RESEARCH INTERN** Microsoft Research, Redmond, WA **Mentors**: Dr. Dinei Florencio | **Group**: Visual Text Intelligence **Highlights**: Developed new dataset and deep learning based vision and language approach for named entity recognition for natural image scene text.
May 2017- Mar 2018	**RESEARCH INTERN** Adobe Research, San Jose, CA **Mentors**: Dr. Scott Cohen and Dr. Brian Price | **Group**: Vision Group **Highlights**: Developed new dataset and deep learning algorithm for question answering on data visualization. Filed for patent for question answering on charts. Published findings in CVPR 2018 and continued collaboration for an improved model published in WACV 2020.
Nov 2012 - Dec 2012	**RESEARCH ASSISTANT** Radio Frequency (RF) and Microwave Engineering Lab, Tribhuvan University, Institute of Engineering, Kathmandu, Nepal **Mentor**: Dr. Nanda Bikram Adhikari **Highlights**: Demonstrated potential attacks and security risks on electronic voting system based on ISO/IEC14443 HF-RFID tags

Teaching Experience

Aug 2014 - May 2015	**TEACHING ASSISTANT** Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, Rochester, NY **Highlights**: Teaching Assistant for courses *Radiometry* and *Fundamentals of Imaging Science*
May 2013 - Oct 2013	**LECTURER** College of Information Technology and Engineering, Purbanchal University, Kathmandu, Nepal **Highligths**: Taught an undergraduate semester course on *Image Processing and Pattern Recognition*

Honors , Awards and Grants

- **Top Reviewer Neural Information Processing System (NeurIPS 2019)**
  Reserved registration, awarded to top 50% of all reviewers.
- **Outstanding Reviewer Computer Vision and Pattern Recognition (CVPR 2019)**
  Awarded to 8% of all reviewers.
- **Outstanding Reviewer Computer Vision and Pattern Recognition (CVPR 2018)**
  Awarded to 8% of all reviewers.

- **Travel Award for Deep Learning Summer School, 2016**
  Registration fee waiver granted to attend deep learning summer school, 2016
- **Amazon AWS Research Grant, 2015**
  Co-applied with Dr. Christopher Kanan. Worth $15,000 in AWS credits.
- **Winner of National R&D Competition, 2012**
  Organized by Alternative Energy Promotion Center, Under ministry of Environment and Population, Nepal Government, seeking innovative solutions for remote monitoring of Solar Home Systems in rural areas of Nepal.
- **Scholarship from Ministry of General Administration, Nepal Government**
  Awarded only to 200 Engineering, Science, and Medicine students across the country.

Professional Services

- **Workshop Organization:**

Workshop on shortcomings in vision and language (SiVL)	**At ECCV, 2018**
Workshop on shortcomings in vision and language (SiVL)	**At NAACL, 2019**

- **Conference Reviewing:**

Computer Vision and Pattern Recognition (CVPR)	**2017, 2018, 2019**
Neural Information Processing System (NeurIPS)	**2016, 2019**
Association for the Advancement of Artificial Intelligence (AAAI)	**2017, 2019**
International Conference on Computer Vision (ICCV)	**2019**
International Conference on Image Processing (ICIP)	**2017**

- **Journal Reviewing:**

Transactions of Pattern Analysis and Machine Intelligence (TPAMI)	**2019**
Computer Vision and Image Understanding (CVIU)	**2017, 2018**
Multimedia Computing Communications and Applications (ACM-TOMM)	**2018, 2019**

Skills

- **Deep Learning Frameworks**: PyTorch, Tensorflow, Keras
- **Scintific Computing Packages**: Numpy, Scipy, Scikit-learn
- **Programming (Proficient)**: Python
- **Programming (Basic/Past)**: C, C++, MATLAB, JavaScript
- **Other**: AWS, Azure, Bash Scripting, Git, LaTeX, Crowd-sourcing (MTurk, UHRS)