Sandeep Kumar

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Education

Indian Institute of Technology Kanpur *Jul. 2015 - Jul. 2019 (exp)*

B.S. in Mathematics and Scientific Computing (8.64/10)

Research Interests

Computer Vision, Natural Language Processing, Machine Learning

Publications

Multimodal Differential Network For Visual Question Generation

EMNLP 2018 PDF

- Developed a method to incorporate exemplars to learn differential embeddings for generating natural questions for an image
- Obtained Multimodal embeddings by combining image and caption information which allows the model to capture relevant context
- Achieved state-of-the-art results on VQA-1.0 and VQG-COCO datasets

Learning Semantic Sentence Embeddings using Pair-wise Discriminator

COLING 2018 PDF

- Proposed a novel method for obtaining sentence-level embeddings by solving the paraphrase generation task
- Introduced a sequential pair-wise discriminator to obtain semantic and relevant sentence embeddings
- Obtained state-of-the-art results on the task of paraphrase generation (Quora dataset) and sentiment analysis (SST dataset)

Bayesian Techniques For Question Generation *(Under Review)*

- Developed a bayesian architecture to procure embeddings for various image related cues like place, caption and tags
- Used a bayesian fusion and moderator module to obtain joint embeddings for different cues
- Obtained 5% improvement over previous state-of-the-art on the task of question generation on VQG-COCO dataset

Internships

Interpretable Visual Dialog *March 2018 - Present*

Research internship with Prof. Devi Parikh

- Analysed Visual Dialog models with the help of GradCAM visualisations
- Adopted a Multi-Task learning setting with Question reconstruction as the auxiliary task for dialog

Video Completion with Deep Learning *Dec 2017 - Jan 2018*

Research internship at NVIDIA Graphics Bangalore

- Built a convolutional generative adversarial network for video generation
- Used multiple discriminators to ensure temporal and spatial consistency of videos

Projects

Mitigating Annotation Costs in legal domain *Oct 2017 - Jan 2018*

Course Project at IIT Kanpur

- Designed a novel algorithm to annotate legal documents in an information retrieval setup
- Eliminated human effort at test time without significantly affecting the performance

Honors & Awards

2015 Among top 5% in JEE Advanced 2015 and top 0.1% in JEE Mains 2015.

2015 Secured 96.4 % in Higher Secondary Examination

2014 Scholar Kishore Vaigyanik Protsahan Yojana (KVPY), National Talent Search Examination (NTSE)

Relevant Courses

Machine learning Techniques	Data Structures & Algorithms	Linear Algebra
Applied Stochastic Processes	Probability & Statistics	Time Series Analysis

Technical Skills

Languages: Python, C++, C, Lua, MATLAB, R **Tools** : LaTeX, MELD, GIT **DL Frameworks** : Torch, PyTorch