

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

CONFERENCE PAPER AT **EMNLP 2018** [LINK FOR PAPER](#)

- Developed a method to incorporate exemplars to learn differential embeddings for generating natural questions for a given 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 multiple datasets using Encoder-Decoder architecture

Learning Semantic Sentence Embeddings using Pair-wise Discriminator

CONFERENCE PAPER AT **COLING 2018** [LINK FOR PAPER](#)

- 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 and sentiment analysis

Experience

Interpretable Visual Dialog

March 2018 - Present

RESEARCH INTERNSHIP AT GEORGIA INSTITUTE OF TECHNOLOGY WITH PROF. DEVI PARIKH

- Analysed Visual Dialog models with the help of GradCAM visualisations
- Imposed additional constraints on the model to do well on multiple tasks

Bayesian Techniques For Question Generation

Jan 2018 - Nov 2018

UNDERGRADUATE RESEARCH AT IIT KANPUR WITH PROF. VINAY P NAMBOODIRI (*This work is under review*)

- Developed a bayesian architecture to procure embeddings for cues such as place, tag and caption
- Used a bayesian fusion module to obtain joint embeddings for different cues
- Proposed a bayesian moderator module to gauge the importance of different fused embeddings

Video Completion with Deep Learning

Dec 2017 - Jan 2018

RESEARCH INTERNSHIP AT NVIDIA GRAPHICS BANGALORE

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

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
- Got rid of 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)
- 2014 Merit Certificate Indian National Chemistry Olympiad, NSEJS (National Junior Science Olympiad)

Relevant Courses

Machine learning Techniques
Applied Stochastic Processes

Data Structures & Algorithms
Probability & Statistics

Linear Algebra
Time Series Analysis

Technical Skills

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