Paper Summaries

01: Zero-Shot Abstractive News Summarization
- Lead bias
  - Can act as summary
- BART
  - Sequence-to-sequence
  - Auto-encoder -- encoder + decoder
  - Corrupting text with arbitrary noise and reconstructing
- T5
  - Text-to-text transfer transformer
  - Mix of pre-training tasks

02: Bringing Order into Texts
- Graph-based ranking model for text processing
- Ranking of nodes in a graph based on links or votes
- Votes are weighted by weight of nodes that links
  - Also, weights on edges
- Nodes are text units
  - Words, sentences, phrases
- Edges
  - Content overlap
  - Cosine similarity of vectors
- Keyword extraction
  - Unigrams and Levenshtein distance
- Sentence extraction
  - Similarity is intersection normalized by sum of logarithm of sentence lengths

03: Semantic Enrichment of Pretrained Embeddings
- Semantically enhancing deep transformer architectures
- Re-rank documents ranked by BERT by using SNOMED-CT
- Co-occurrence based metric
- OHSUMED dataset of documents from biomedical domain
- SNOMED is a knowledge base in medical domain
- MetaMap maps terms in SNOMED to UMLS metathesaurus concepts
- Intersection of concepts
  - Score multiplied with relevance

04: Efficient Next-page Retrieval
- Next page of results
  - k to 2k
- Computing on demand not good for more queries
- Computing 2k always not good for less queries
- Four kinds of documents
  - Successful, ejected, denied, bypassed
- Method 1: Retaining ejected documents
  - Approximate
- Method 2: Adding denied documents
  - Approximate
- Method 3: Adding bypassed documents
  - Safe

05: Wikipedia Multimodal Multilingual Image Text Dataset
- WIT dataset
  - Multi-lingual: 100+
  - Each language has at least 12K examples
  - Multi-modal: Image and text
- Total

            37.5 million entity-rich image-text examples
            11.5 million unique images
            108 languages
      Tasks
            Image-text retrieval
            Image captioning
            Visual question-answering
            Visual entailment
            Visual commonsense reasoning

06: Learning to Ask Screening Questions for Job Postings
      Questions generated for job postings
      Question template prediction for a job posting sentence
      Training data is crowdsourced and then user feedback
      Sentence encoder
            BERT
            DAN: Deep Average Network
            DAN averages token vectors and then 2 fully connected layers

07: Multilingual Clustering of Streaming News
      Each document has a monolingual vector and a multilingual one
      Monolingual vector
            Tf-idf of words, lemmas, and named entities
      Crosslingual vector
            Summation of monolingual embeddings
      Identify monolingual cluster
            Nearest centroid
      Associate it with multilingual cluster
            Nearest centroid
      Cosine similarity function

08: Swarm-optimized Clustering Framework
      Documents clustered using swarm optimization
            Boids: bird-like objects
            Cohesion: birds will move towards a cluster
            Separation: no collision
            Alignment: all moving in the same direction
            Similarity: Tf-idf
      Frequent patterns for each cluster
            Recursive elimination algorithm
      Query assigned to a cluster
            Query keywords
      Similarity of query with documents in the cluster
            Cosine similarity

09: Term Independent Likelihood Model for Passage Re-ranking
      Relevance of a document is likelihood of query being generated from it
      BERT
            Text of document
            Probability of output for each query token
      Re-ranking by taking into account both likelihoods

10: ELMo: Deep Contextualized Word Representations
      Bi-directional language models
            LMs are stacked LSTMs
      Task-specific weighting of bi-directional LM layers

11: Mathematical Formula Retrieval
      Formula representation trees

- Symbol Layout Tree
- Operator Tree
- Subtree matching
  - Largest match
- Full tree matching
  - Tree edit distance
- Embedding models
  - Tangent family that uses n-grams

12: Sentence Embeddings using Siamese BERT Networks
- Sentence-BERT
- Siamese network
- Triplet objective/loss function
  - Distance between anchor and positive sentence is less than that between anchor and negative sentence
- Sentence textual similarity
  - Cosine similarity
- Sentence entailment

13: Improved BM25 for Clinical Decision Support
- Retrieve abstracts of biomedical articles
- Expanded word score
  - dcl: length of chemical words
  - dml: length of MESH headings
  - dkl: length of keywords
- Co-word score
  - Disease and gene co-occurring
- Cuckoo search to optimize the parameters

14: Music Emotion Recognition from Lyrics
- Project lyrics to an emotion space
  - Valence represents pleasantness
  - Arousal represents energy level
- XLNet transformer
  - Auto-regressive
  - Uses arbitrary permutations of tokens for predicting a particular token

15: Cross-lingual Cross-modal Pretraining for Multimodal Retrieval
- VL-BERT
  - Visual-linguistic BERT
  - Cross-modal vision-language model
  - Inputs are concatenated word features and bounding box image features
- Embeddings
  - Token embedding
  - Visual feature embedding
  - Segment embedding
  - Sequence embedding
- Tasks
  - Masked language modeling with visual clues
  - Masked RoI classification with linguistic clues

16: Reasoning about Physical Commonsense in Natural Language
- Question-answering on common sense not explicitly present
- Question and two possible solutions
  - Choose the most appropriate one
- Deep learning networks
  - GPT, BERT, RoBERTa

17: Passage Search via Contextualized Late Interaction over BERT

ColBERT
Query and document into contextual embeddings
Contextual embeddings interact late, i.e., only the last layer
Query embedding
Masked tokens for query augmentation
Document embedding
Punctuation token embeddings filtered

18: Modified Firefly Algorithm and Fuzzy C-Means for Semantic IR
Features are chosen by modified firefly algorithm
Swarm-based algorithm
Fitness functions for summary
Topic relation factor
Cohesion factor
Readability factor
Documents clustered by fuzzy C-means
Ranking through LDA

19: Principled Multi-aspect Evaluation Measures for Rankings
Documents ranked in total order
Multiple aspects
Relevance, correctness, usefulness
Each aspect has total order
Overall partial order since documents may be incomparable
Best label tuple
Distance from best tuple to define weak order
Coordinates are best for every aspect