

Intention prediction from sentence using CNN for Robot Behavior Generation

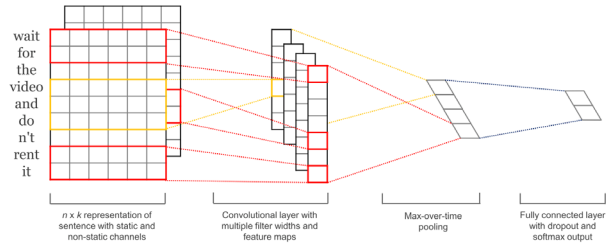
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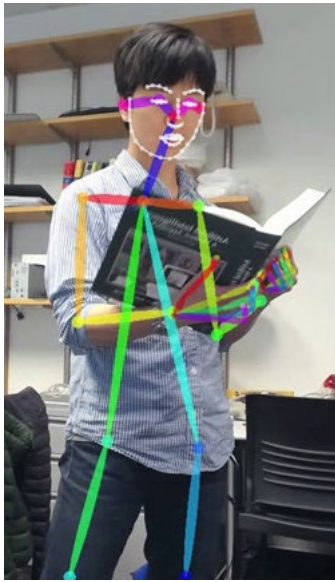


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Behaviour Generation Pipeline

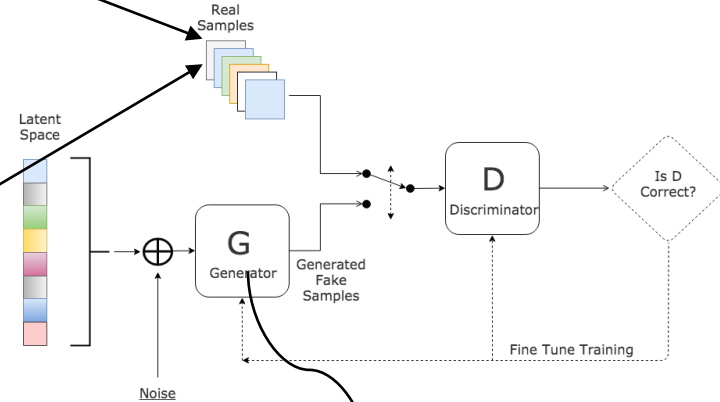


Sentence classification



Keypoints detection

Generative Adversarial Network



Domain Transfer Network

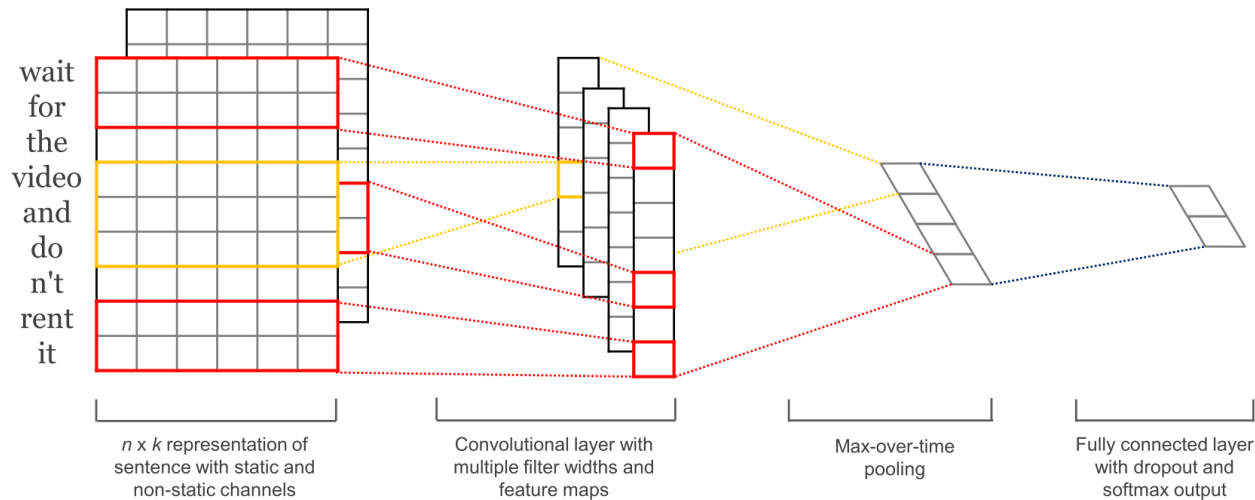
Silbot

Ever

Nao

Others

Convolution Neural Network Architecture for sentence classification - Kim, Y. (2014). Convolutional Neural Networks for Sentence Classification



Hyperparameters

- Word2vec for word embeddings ($d=300$)
- Use (2, 3, 4) multiple filters
- Rectified linear unit for activation function
- 100 feature maps
- 1-max pooling
- 0.5 Dropout rate
- 3 l2 norm constraint

Switchboard Dialog Act Corpus

- The Switchboard is a collection of about 2,400 two-sided telephone conversations among 543 speakers (302 male, 241 female)
- About 70 topics were provided, of which about 50 were used frequently
- Over 200 tags (syntactic, semantic, and pragmatic information)
- Collapsing them down to 43 tags
- 9 tags from 43 tags which can be useful for generating robot behavior

Tags for classification

- Appreciation
- WH_Question, Yes_No_Question, Rhetorical_Question, Open_Question
- Statement_Opinion, Statement_Non_Opinion
- Summarize
- Quotation

Result

- Accuracy $((TP + TN) / (P + N))$ is **0.645** with 2.221 loss

Future Works

- Conduct more sensible hyperparameters tuning
- Increase the number of dataset for training
- Try different ratio for each tags in the dataset
- Try different method for input representations.