Aspect-Based Sentiment Analysis

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ÖZYEĞİN ÜNİVERSİTESİ

Problem Statement

- Identify different aspects of a sentence. Each aspect consists of 3 subtasks:
  1. Aspect category detection:

     "The pizza is overpriced and soggy."

     Category: Food-quality
     Category: Food-price

  2. Aspect Term extraction:

     "The food was tasty and the service impeccable."

     Target: pizza
     Target: service

  3. Sentiment polarity estimation:

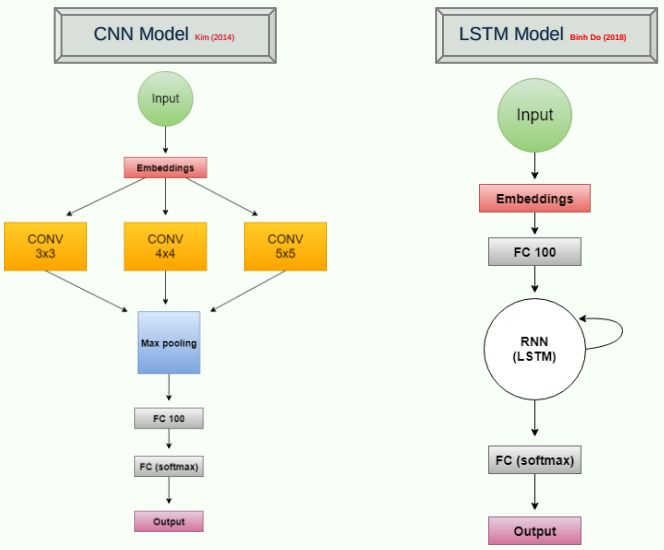
     "The onion rings are great! "

     Polarity: Positive

Work description

- 1st Semester:
  - Subtask 2:
    1. Rule-based approach
    2. ML approach (CRF)
  - Subtask 1: One-vs-rest classification (SVM) with thresholding
  - Subtask 3: One-vs-rest classification (SVM)
- 2nd Semester:
  - Subtask 1:
    1. CNN classifier
    2. One-vs-rest classifier (CNN)
  - Subtask 3:
    1. CNN classifier
    2. LSTM classifier

Overall Approach/Design



Implementation Issues

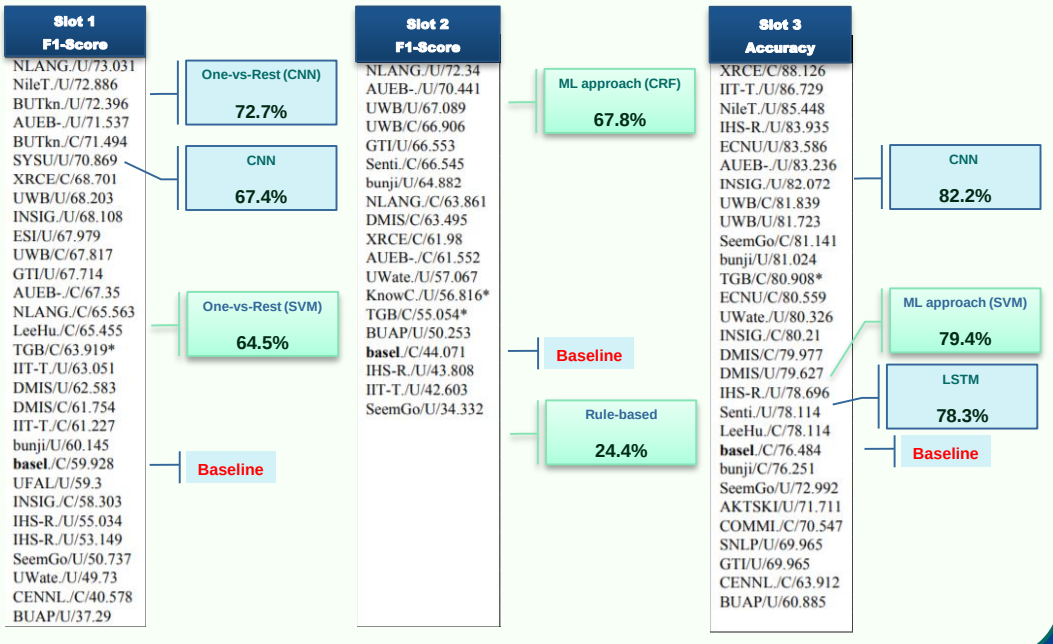
Challenges:

- Selecting model/network architecture
- Hyper-parameter tuning
- Feature engineering for CRF aspect term extraction

Employed Tools, Techniques:

- TensorFlow, Sklearn, CoreNLP, NLTK libraries
- Sequence labeling (IOB tagging)
- TF-IDF
- Word embeddings
- Model regularization (L2 regularization, Dropout)
- Cross-validation

Results (English restaurant reviews)



Validation

Tested on other languages and domains (SLOT3)

Arabic hotel reviews

	F1-Score
INSIG	0.827
Our model (CNN)	0.818
IIT-T	0.817
Baseline	0.764

Turkish restaurant reviews

	F1-Score
IIT-T	0.842
Our model (CNN)	0.754
INSIG	0.742
Baseline	0.723