

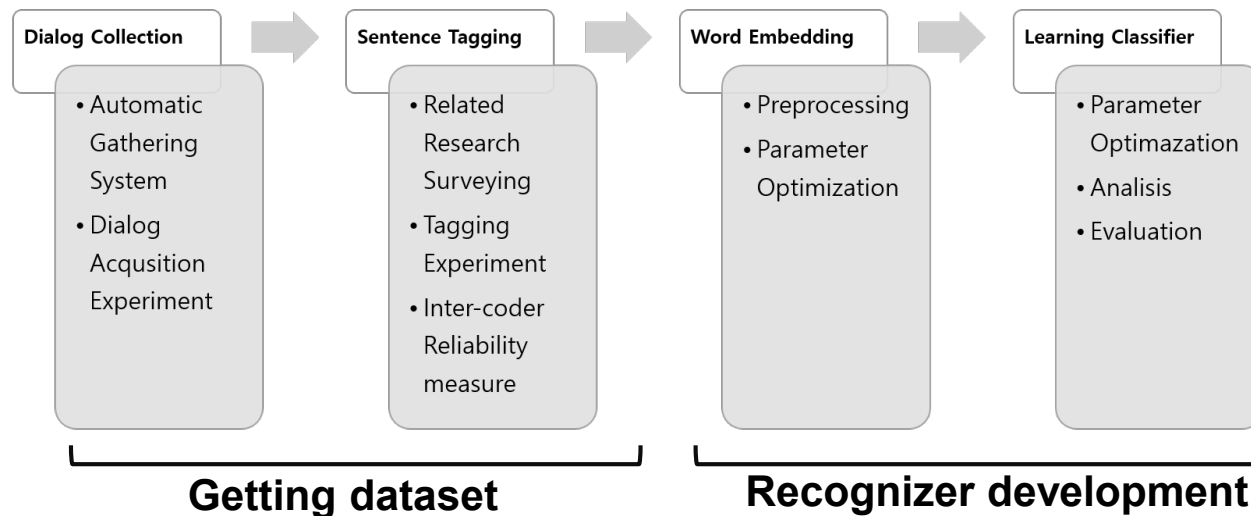
Text-based Social Dialogue Strategy Recognizer for Social Robots

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Objective : Recognizing social dialogue strategy in sentences

- Social dialogue strategy : Factors that change social relationships through dialogue
 - Motivation : For a research to understanding and modeling social dialogue*
- Research process



*Zhao, R., Sinha, T., Black A., Cassell, J (2016) "Automatic Recognition of Conversational Strategies in the Service of a Socially-Aware Dialog System." Proceedings of the 17th annual SIGDIAL Meeting on Discourse and Dialogue (SIGDIAL 2016).

- Dataset
 - Dialogue Acquisition
 - Tagging Social Strategy
 - Korean language

Characteristics	Amount
Size	1 M
Total Dialogues	650
Unique sentence	4,200
Tagging reliability	Krippendorf's $\alpha = 0.76$
Tagger Num	6 (2 Group, 3 person each)

<Dataset info>

- Word Embedding
 - Pre-processing : spell check, tokenize, Stemming, stop word remove
 - Use Paragraph Vector(Doc2vec)*
 - Select parameters after comparing to classifier

Parameters	Range
Embedding Methods	PV-DM / PV-DBOW
Window Size	5, 8, 11(less impact)
Vector Size	100, 200, 400 , 600, 800
Max epoch	20 ~ 1600 , 200~400

<Controlled parameters>

* Quoc Le and Tomas Mikolov, "Distributed Representations of Sentences and Documents," ICML,2014.

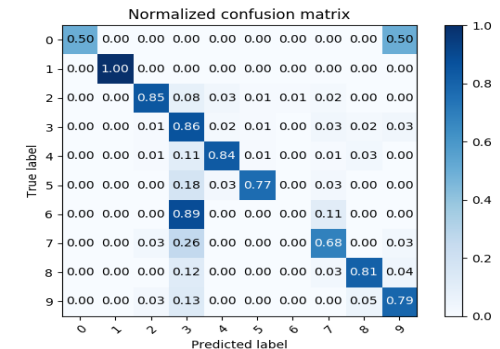
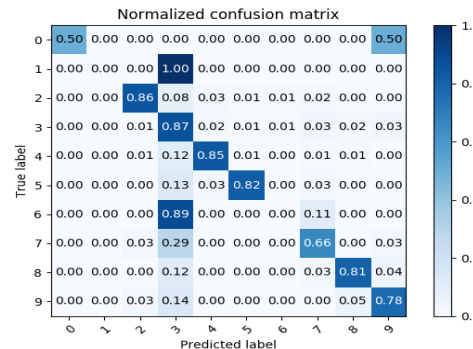
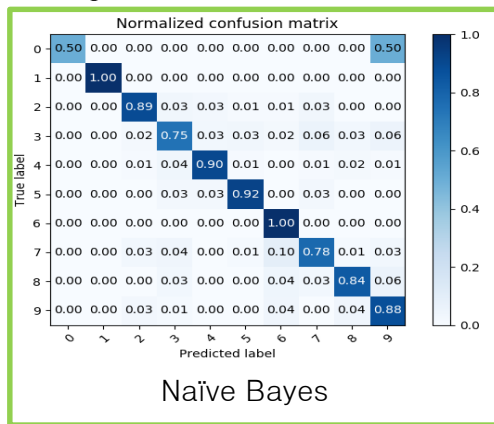
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- Classifier learning & Result

Method \ Metrics	Naïve Bayes (DM/DBOW)	Logistic Regression (DM/DBOW)	SVM (DM/DBOW)
F1-Score	0.78/0.83	0.50/0.80	0.78/0.82

- Unbalanced test-set
- Operation Speed : 10~20 ms

Fig. 2. Confusion Matrix of each Classifier methods



- Conclusion

- We made social strategy recognizer by using Naïve Bayes & Paragraph Vector with NLP
- Use : As a tool or module for social dialogs generation research.