

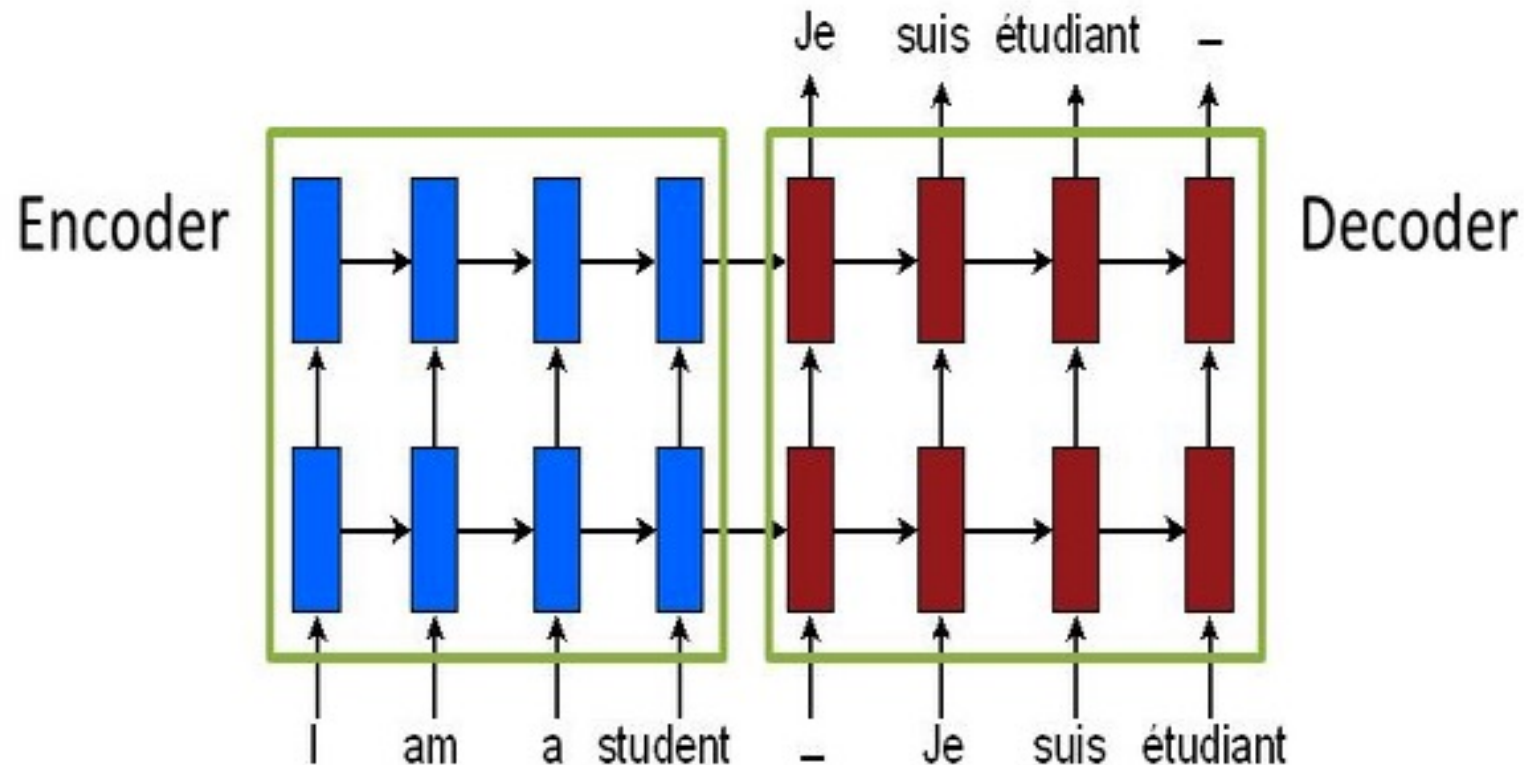
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## 다양한 자연어처리(Natural Language Processing-NLP-) 문제 영역

- Machine Translation
- Sentiment Analysis
- Spam Filtering
- Image Captioning
- Text Summarization
- Question Answering
- Dialogue Generation

## NLP 문제 영역 – Machine Translation

- **Machine Translation** : 한국어를 영어로, 또는 영어를 한국어로 번역하는 등 하나의 언어를 다른 언어로 번역하는 문제영역입니다.



# NLP 문제 영역 – Sentiment Analysis

- **Sentiment Analysis** : 문장의 감정상태를 분석해서 긍정 혹은 부정 또는 N개의 다른 감정 상태를 분류하는 문제영역입니다.

## Hotel

HOTEL	outdated 23	smelly 22	clean 15	not as advertised 4
OPINION	overall disappointed 34	will not return 22	will recommend 9	

## Room

ROOM	clean 34	spacious 22	well equipped 15	sth broken 4
BATHROOM	well equipped 23	shower problem 19	clean 15	outdated 13
	small 8			

## Service

STAFF	helpful, friendly 23	unhelpful, unfriendly 15	check-in slow 12
RESTAURANT SERVICE	poor, slow 8		
MANAGER	unhelpful, ineffective 8		
VALET SERVICE	bad, slow 23		

## Price

HOTEL	overpriced 23	money waste 15	adequate price 4
PAYMENT	bill problem 8	additional fees 5	refund problem 3

## Location

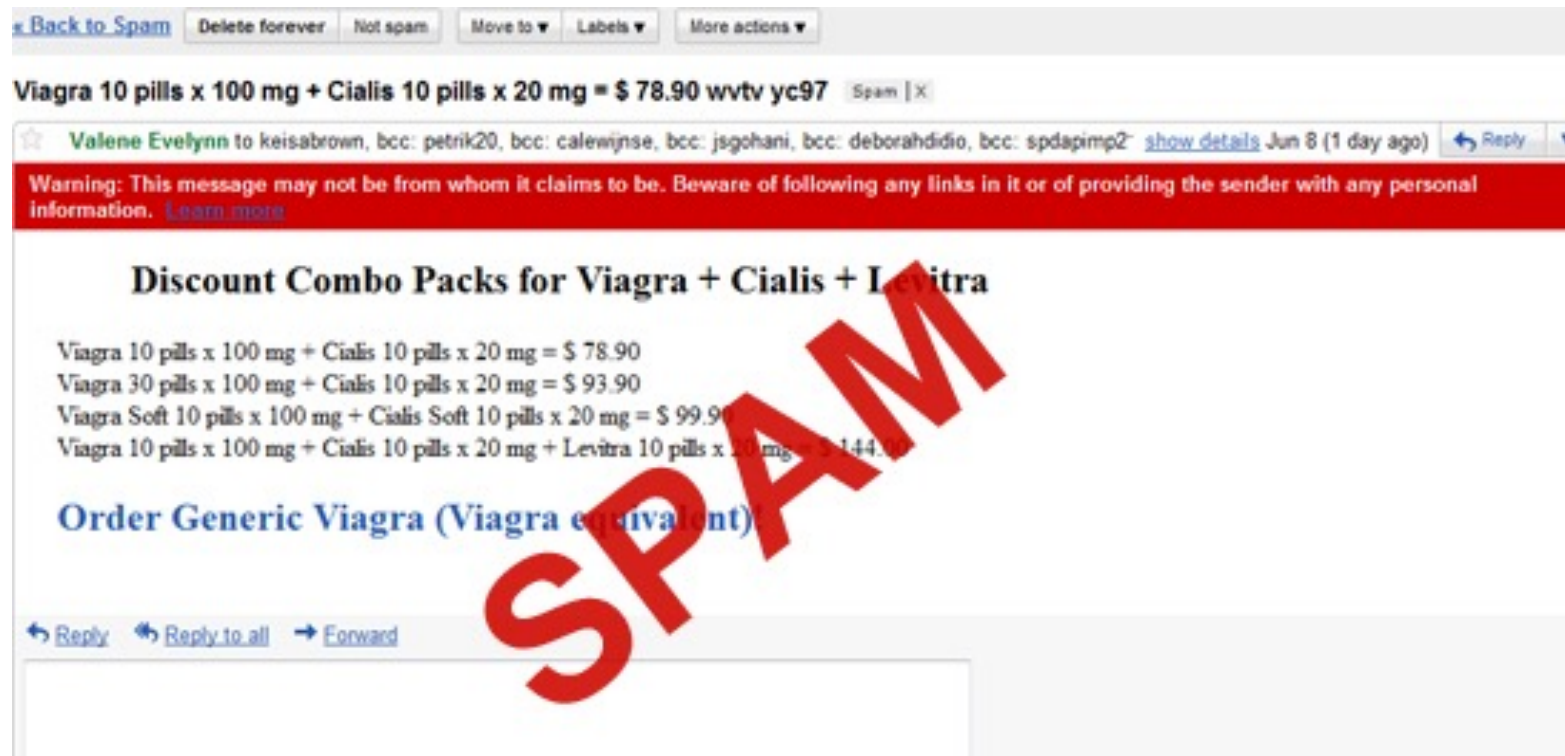
CLOSE TO	highway 7	city center 5	public transportation 4
NEIGHBORHOOD	not safe 14		

## Addons

WIFI	free 11	problem 9	slow 7
TV	bad, poor channels 13		
PARKING	small 19	not free 17	
POOL	closed 8		
HANDICAP	not accessible 9		

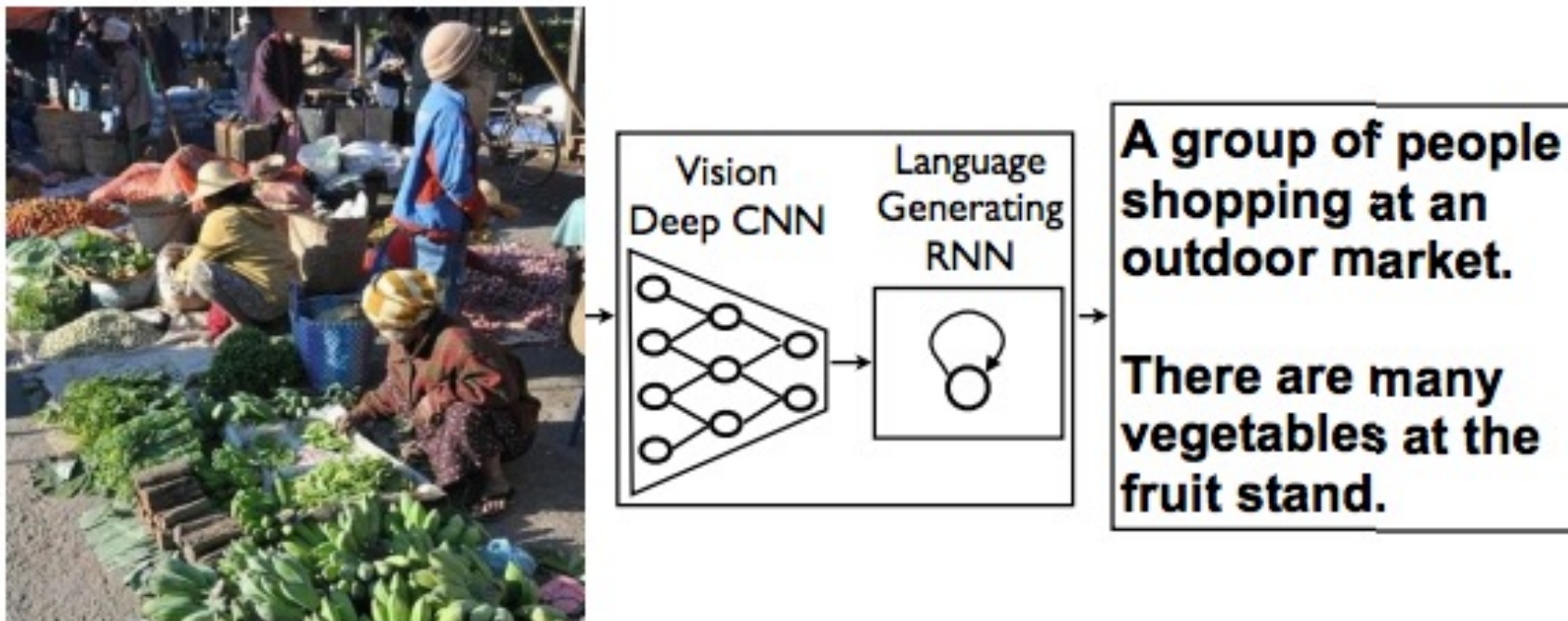
## NLP 문제 영역 – Spam Filtering

- **Spam Filtering** : 텍스트가 스팸인지 아닌지를 분류하는 문제 영역입니다.



## NLP 문제 영역 – Image Captioning

- **Image Captioning** : 이미지에 대한 설명문을 자동 생성하는 문제 영역입니다.





# NLP 문제 영역- Text Summarization

- **Text Summarization** : 텍스트에 대한 요약문을 자동으로 만들어내는 문제 영역입니다.

<b>Source document</b>
Jenson Button was denied his 100th race for McLaren after an ERS prevented him from making it to the start-line. It capped a miserable weekend for the Briton; his time in Bahrain plagued by reliability issues. Button spent much of the race on Twitter delivering his verdict as the action unfolded. 'Kimi is the man to watch,' and 'loving the sparks', were among his pearls of wisdom, but the tweet which courted the most attention was a rather mischievous one: 'Ooh is Lewis backing his team mate into Vettel?' he quizzed after Rosberg accused Hamilton of pulling off such a manoeuvre in China. Jenson Button waves to the crowd ahead of the Bahrain Grand Prix which he failed to start Perhaps a career in the media beckons... Lewis Hamilton has out-qualified and finished ahead of Nico Rosberg at every race this season. Indeed Rosberg has now beaten his Mercedes team-mate only once in the 11 races since the pair famously collided in Belgium last year. Hamilton secured the 36th win of his career in Bahrain and his 21st from pole position. Only Michael Schumacher (40), Ayrton Senna (29) and Sebastian Vettel (27) have more. (...)
<b>Ground truth summary</b>
Button denied 100th race start for McLaren after ERS failure. Button then spent much of the Bahrain Grand Prix on Twitter delivering his verdict on the action as it unfolded. Lewis Hamilton has out-qualified and finished ahead of Mercedes team-mate Nico Rosberg at every race this season. Bernie Ecclestone confirms F1 will make its bow in Azerbaijan next season.
<b>ML, with intra-attention (ROUGE-1 41.58)</b>
Button was denied his 100th race for McLaren. ERS prevented him from making it to the start-line. The Briton. He quizzed after Nico Rosberg accused Lewis Hamilton of pulling off such a manoeuvre in China. Button has been in Azerbaijan for the first time since 2013.
<b>RL, with intra-attention (ROUGE-1 50.00)</b>
Button was denied his 100th race for McLaren after an ERS prevented him from making it to the start-line. It capped a miserable weekend for the Briton. Button has out-qualified. Finished ahead of Nico Rosberg at Bahrain. Lewis Hamilton has. In 11 races. . The race. To lead 2,000 laps. . In. . . And. .
<b>ML+RL, with intra-attention (ROUGE-1 44.00)</b>
Button was denied his 100th race for McLaren. The ERS prevented him from making it to the start-line. Button was his team mate in the 11 races in Bahrain. He quizzed after Nico Rosberg accused Lewis Hamilton of pulling off such a manoeuvre in China.

# NLP 문제 영역 – Question Answering

- **Question Answering** : 질문에 대한 정답 텍스트를 찾아내는 문제영역입니다.

## Stanford Question Answering Dataset (SQuAD)

### Passage

Super Bowl 50 was an American football game to determine the champion of the National Football League (NFL) for the 2015 season. The **American Football Conference** (AFC) champion **Denver Broncos** defeated the National Football Conference (NFC) champion Carolina Panthers 24–10 to earn their third Super Bowl title. The game was played on February 7, **2016**, at Levi's Stadium in the San Francisco Bay Area at Santa Clara, California.

**Question:** Which NFL team won Super Bowl 50?

**Answer:** **Denver Broncos**

**Question:** What does AFC stand for?

**Answer:** **American Football Conference**

**Question:** What year was Super Bowl 50?

**Answer:** **2016**

# NLP 문제 영역 – Dialogue Generation

- **Dialogue Generation** : 봇이 자동으로 텍스트를 생성해내는 문제영역입니다.

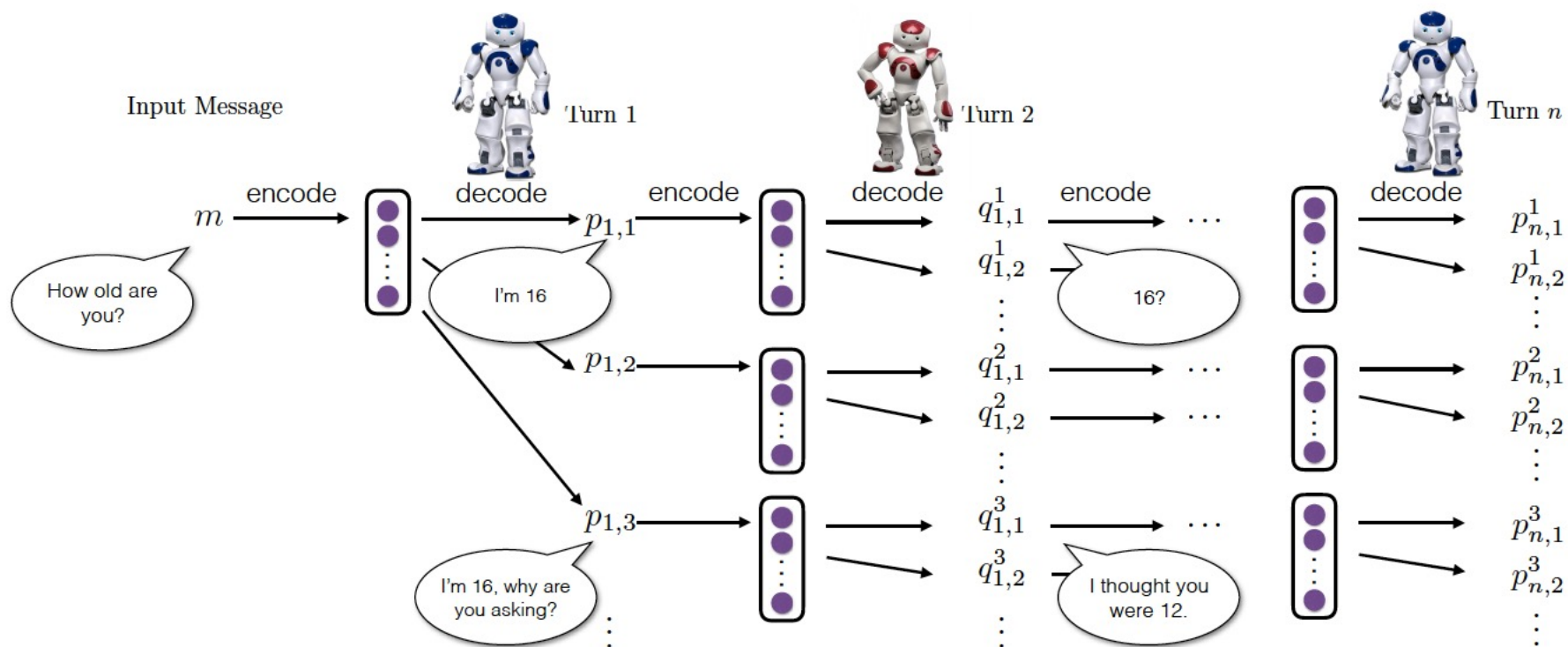


Figure 1: Dialogue simulation between the two agents.



## 자연어처리(Natural Language Processing-NLP-) 문제 영역에 기반한 AI 기술의 응용 분야

- **Chatbot** : 자동으로 고객 상담을 진행하는 챗봇등에 NLP 기술이 응용될 수 있습니다.
- **Translation** : 자동 번역 등의 분야에 NLP 기술이 응용 될 수 있습니다.
- **Sentiment Analysis** : 고객의 리뷰 텍스트등을 통해서 Sentiment Analysis 등에 응용 될 수 있습니다.
- **Recommendation System** : 고객의 텍스트 로그를 토대로 고객에게 최적화된 품목을 추천해줄 수 있습니다.



Chatbot

Translation

Sentiment  
Analysis

Recommen  
dation  
System