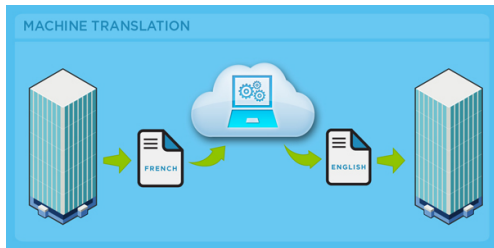# Applications

He sat on a <u>chair</u>.

Language Modeling

- ► Mikolov et al. (2010)
- ► Li et al. (2015)
- ► Kiros et al. (2015)
- ► Kim et al. (2015)

Speech Recognition

- Hinton et al. (2012)
- Graves et al. (2013)
- Chorowski et al. (2015)
- Sak et al. (2015)

Machine Translation

- Kalchbrenner et al. (2013)
- Cho et al. (2014)
- Bahdanau et al. (2015)
- Jean et al. (2015)
- Gulcehre et al. (2015)
- Sutskever et al. (2014)
- Luong et al. (2015)

Time	User	Utterance
03:44	Old	I dont run graphical ubuntu, I run ubuntu server.
03:45	kuja	Taru: Haha sucker.
03:45	Taru	Kuja: ?
03:45	bur[n]er	Old: you can use "ps ax" and "kill (PID#)"
03:45	kuja	Taru: Anyways, you made the changes right?
03:45	Taru	Kuja: Yes.
03:45	LiveCD	or killall speedlink
03:45	kuja	Taru: Then from the terminal type: sudo apt-get update
03:46	_pm	if i install the beta version, how can i update it when the final version comes out?
03:46	Taru	Kuja: I did.

Sender	Recipient	Utterance
Old		I dont run graphical ubuntu, I run ubuntu server.
bur[n]er	Old	you can use "ps ax" and "kill (PID#)"
kuja	Taru	Haha sucker.
Taru	Kuja	?
kuja	Taru	Anyways, you made the changes right?
Taru	Kuja	Yes.
kuja	Taru	Then from the terminal type: sudo apt-get update
Taru	Kuja	I did.

Conversation Modeling

- Shang et al. (2015)
- Vinyals et al. (2015)
- Lowe et al. (2015)
- Dodge et al. (2015)
- Weston et al. (2016)

| **Task 1: Single Supporting Fact** |
| Mary went to the bathroom. |
| John moved to the hallway. |
| Mary travelled to the office. |
| Where is Mary? A:office |

| **Task 2: Two Supporting Facts** |
| John is in the playground. |
| John picked up the football. |
| Bob went to the kitchen. |
| Where is the football? A:playground |

| **Task 3: Three Supporting Facts** |
| John picked up the apple. |
| John went to the office. |
| John went to the kitchen. |
| John dropped the apple. |
| Where was the apple before the kitchen? A:office |

| **Task 4: Two Argument Relations** |
| The office is north of the bedroom. |
| The bedroom is north of the bathroom. |
| The kitchen is west of the garden. |
| What is north of the bedroom? A: office |
| What is the bedroom north of? A: bathroom |

Question Answering

- Weston et al. (2015)
- Bordes et al. (2015)
- Hill et al. (2016)
- Hermann et al. (2015)
- Kumar et al. (2016)

Object Recognition

- Pinheiro et al. (2015)
- Liang et al. (2015)
- Byeon et al. (2015)
- Serban et al. (2015)
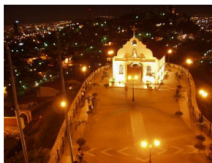- Zheng et al. (2015)
- Liang et al. (2015)
- Bell et al. (2015)

Visual Tracking

- Gan et al. (2015)
- Gregor et al. (2015)
- Lazaridou et al. (2015)
- Theis et al. (2015)
- Van et al. (2016)

Video Analysis

- Srivastava et al. (2015)
- and many more

Retr.
1. Top view of the lights of a city at night, with a well-illuminated square in front of a church in the foreground;
2. People on the stairs in front of an illuminated cathedral with two towers at night;

Gen.
A square with burning street lamps and a street in the foreground;

1. Tourists are sitting at a long table with beer bottles on it in a rather dark restaurant and are raising their bierglaeser;
2. Tourists are sitting at a long table with a white table-cloth in a somewhat dark restaurant;

Tourists are sitting at a long table with a white table cloth and are eating;

Image Captioning

- Mao et al. (2014)
- Mao at al. (2015)
- Kiros et al. (2015)
- Donahue et al. (2015)
- Vinyals et al. (2015)
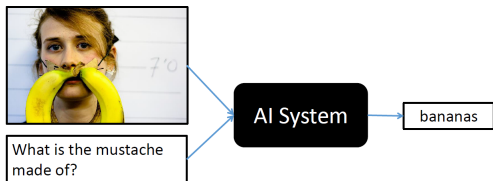- Karpathy et al. (2015)
- Fang et al. (2015)
- Chen et al. (2015)

A group of young men playing a game of soccer

A man riding a wave on top of a surfboard.

Video Captioning

- Donahue et al. (2014)
- Venugopalan at al. (2014)
- Pan et al. (2015)
- Yao et al. (2015)
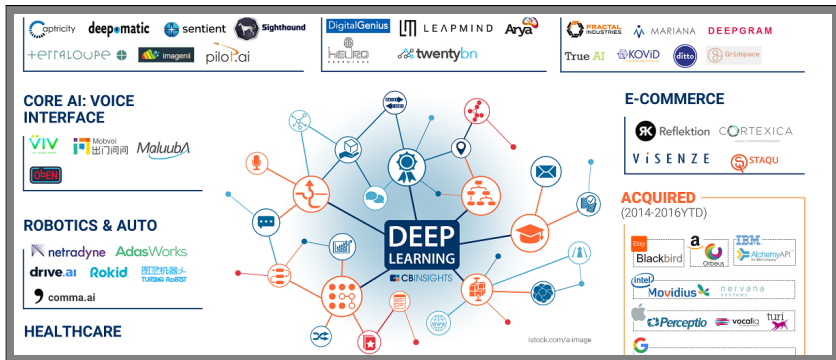- Rohrbach et al. (2015)
- Zhu et al. (2015)
- Cho et al. (2015)

Visual Question Answering

- Antol et al. (2014)
- Malinowski at al. (2015)
- Ren et al. (2015)
- Gao et al. (2015)
- Kim et al. (2016)
- Fukui et al. (2016)
- Noh et al. (2016)
- Tapaswi et al. (2015)

Neural Turing Machines

- Graves et al. (2014)
- Joulin at al. (2015)
- Sukhbaatar et al. (2015)
- Zaremba et al. (2015)
- Kurach et al. (2015)
- Caballero et al. (2015)
- Mei et al. (2015)
- Zhang et al. (2015)

Startups

The Deep Learning Market Map