

Chapter 8: The Madness (2013-)

He sat on a chair.

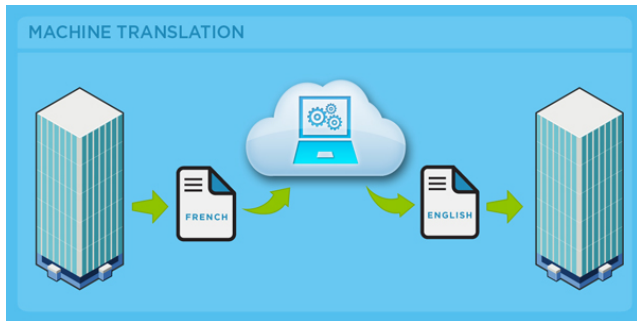
Language Modeling

- Mikolov et al. (2010)^[1]
- Kiros et al. (2015)^[2]
- Kim et al. (2015)^[3]



Speech Recognition

- Hinton et al. (2012)^[4]
- Graves et al. (2013)^[5]
- Chorowski et al. (2015)^[6]
- Sak et al. (2015)^[7]



Machine Translation

- Kalchbrenner et al. (2013)^[8]
- Cho et al. (2014)^[9]
- Bahdanau et al. (2015)^[10]
- Jean et al. (2015)^[11]
- Gulcehre et al. (2015)^[12]
- Sutskever et al. (2014)^[13]
- Luong et al. (2015)^[14]
- Zheng et al. (2017)^[15]
- Cheng et al. (2016)^[16]
- Chen et al. (2017)^[17]
- Firat et al. (2016)^[18]

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

Conversation Modeling

- Shang et al. (2015)^[19]
- Vinyals et al. (2015)^[20]
- Lowe et al. (2015)^[21]
- Dodge et al. (2015)^[22]
- Weston et al. (2016)^[23]
- Serban et al. (2016)^[24]
- Bordes et al. (2017)^[25]
- Serban et al. (2017)^[26]

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

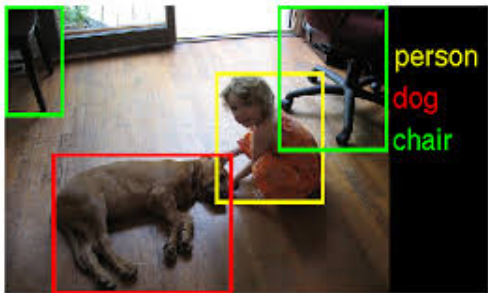
John picked up the apple.
 John went to the office.
 John went to the kitchen.
 John dropped the apple.
 Where was the apple before the kitchen? A:office

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

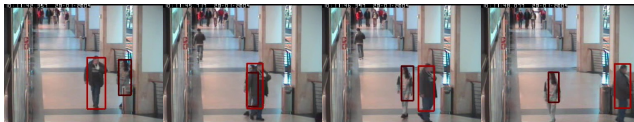
Question Answering

- Hermann et al. (2015)^[27]
- Chen et al. (2016)^[28]
- Xiong et al. (2016)^[29]
- Seo et al. (2016)^[30]
- Dhingra et al. (2017)^[31]
- Wang et al. (2017)^[32]
- Hu et al. (2017)^[33]



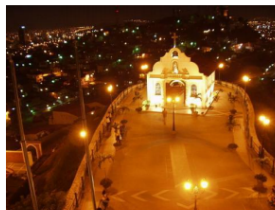
Object Detection/Recognition

- Semantic Segmentation (Long et al, 2015)^[34]
- Recurrent CNNs (Liang et al., 2015)^[35]
- Faster RCNN (Ren et al., 2015)^[36]
- Inside-Outside Net (Bell et al., 2015)^[37]
- YOLO9000 (Redmon et al., 2016)^[38]
- R-FCN (Dai et al., 2016)^[39]
- Mask R-CNN (He et al., 2017)^[40]
- Video Object segmentation (Caelles et al., 2017)^[41]



Visual Tracking

- Choi et al. (2017)^[42]
- Yun et al. (2017)^[43]
- Alahi et al. (2017)^[44]



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;

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

Gen.

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

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

Image Captioning

- Mao et al. (2014)^[45]
- Mao et al. (2015)^[46]
- Kiros et al. (2015)^[47]
- Donahue et al. (2015)^[48]
- Vinyals et al. (2015)^[49]
- Karpathy et al. (2015)^[50]
- Fang et al. (2015)^[51]
- Chen et al. (2015)^[52]



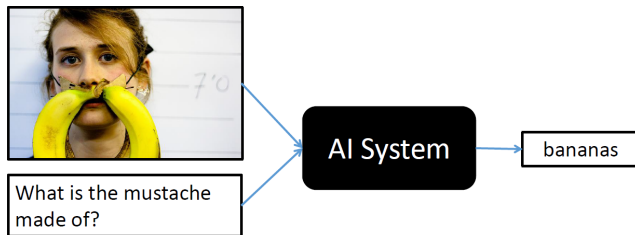
A group of young men playing a game of soccer



A man riding a wave on top of a surfboard.

Video Captioning

- Donahue et al. (2014)^[53]
- Venugopalan et al. (2014)^[54]
- Pan et al. (2015)^[55]
- Yao et al. (2015)^[56]
- Rohrbach et al. (2015)^[57]
- Zhu et al. (2015)^[58]
- Cho et al. (2015)^[9]



Visual Question Answering

- Santoro et al. (2017)^[59]
- Hu et al. (2017)^[60]
- Johnson et al. (2017)^[61]
- Ben-younes et al. (2017)^[62]
- Malinowski et al. (2017)^[63]
- Kazemi et al. (2016)^[64]

She _____.



(nods)

She opens the _____.



(door)



Question: What is the cat doing? Answer: playing with a tablet

Video Question Answering

- Tapaswi et. al. 2016^[65]
- Zeng et. al. 2016^[66]
- Maharaj et. al. 2017^[67]
- Zhao et. al. 2017^[68]
- Yu Youngjae et. al. 2017^[69]
- Xue Hongyang et. al. 2017^[70]
- Mazaheri et. al. 2017^[71]

Input video



Summary



Video Summarization

- Chheng 2007^[72]
- Ajmal 2012^[73]
- Zhang Ke 2016^[74]
- Zhong Ji 2017^[75]
- Panda 2017^[76]



Generating Authentic Photos

- Variational Autoencoders (Kingma et. al., 2013)^[77]
- Generative Adversarial Networks (Goodfellow et. al., 2014)^[78]
- Plug & Play generative nets (Nguyen et al., 2016)^[79]
- Progressive Growing of GANs (Karras et al., 2017)^[80]



Generating Raw Audio

- Wavenets (Oord et. al., 2016)^[81]



Pixel RNNs

- (Oord et al., 2016)^[82]
- (Oord et al., 2016)^[83]
- (Salimans et al., 2017)^[84]

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