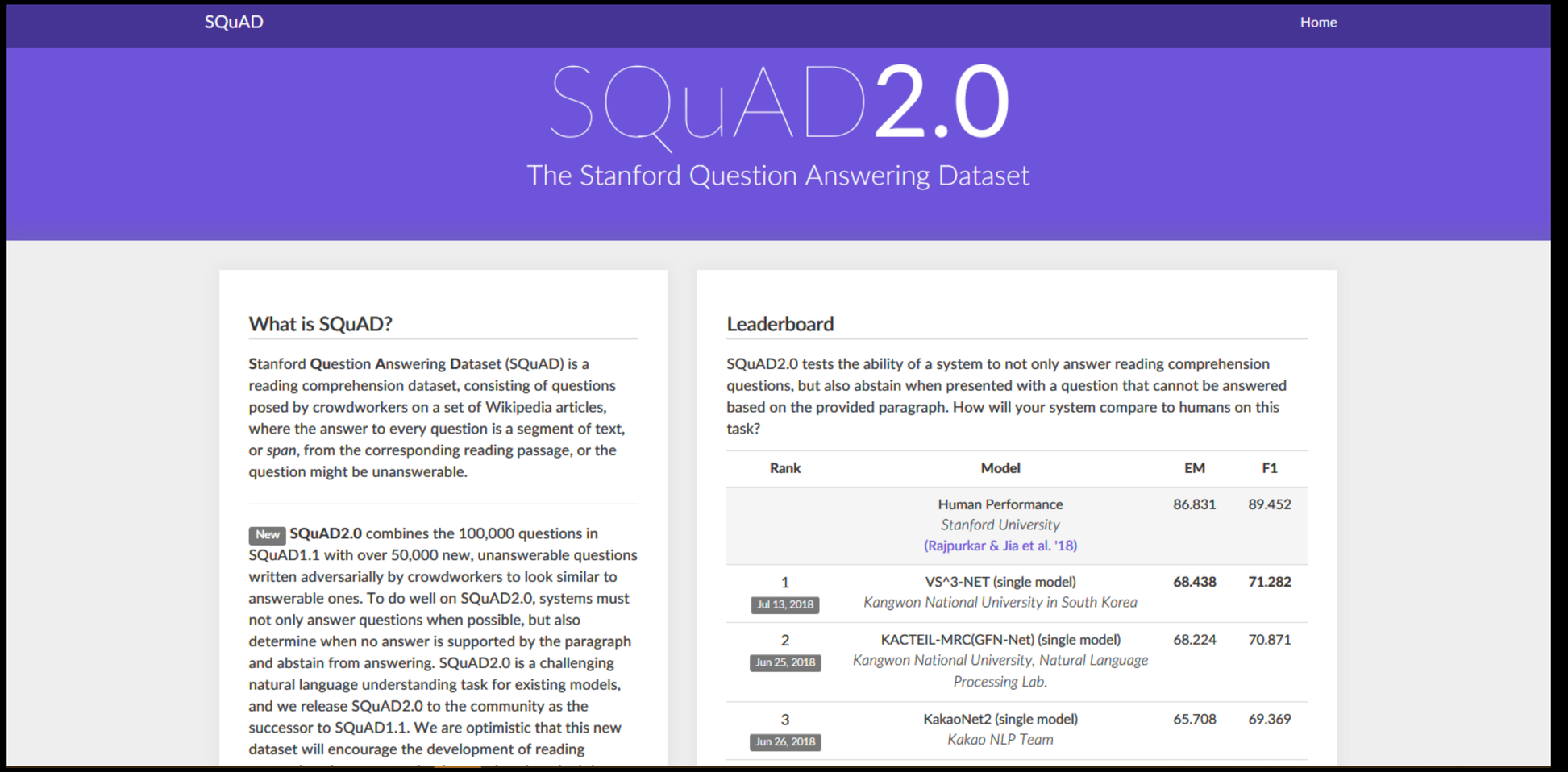
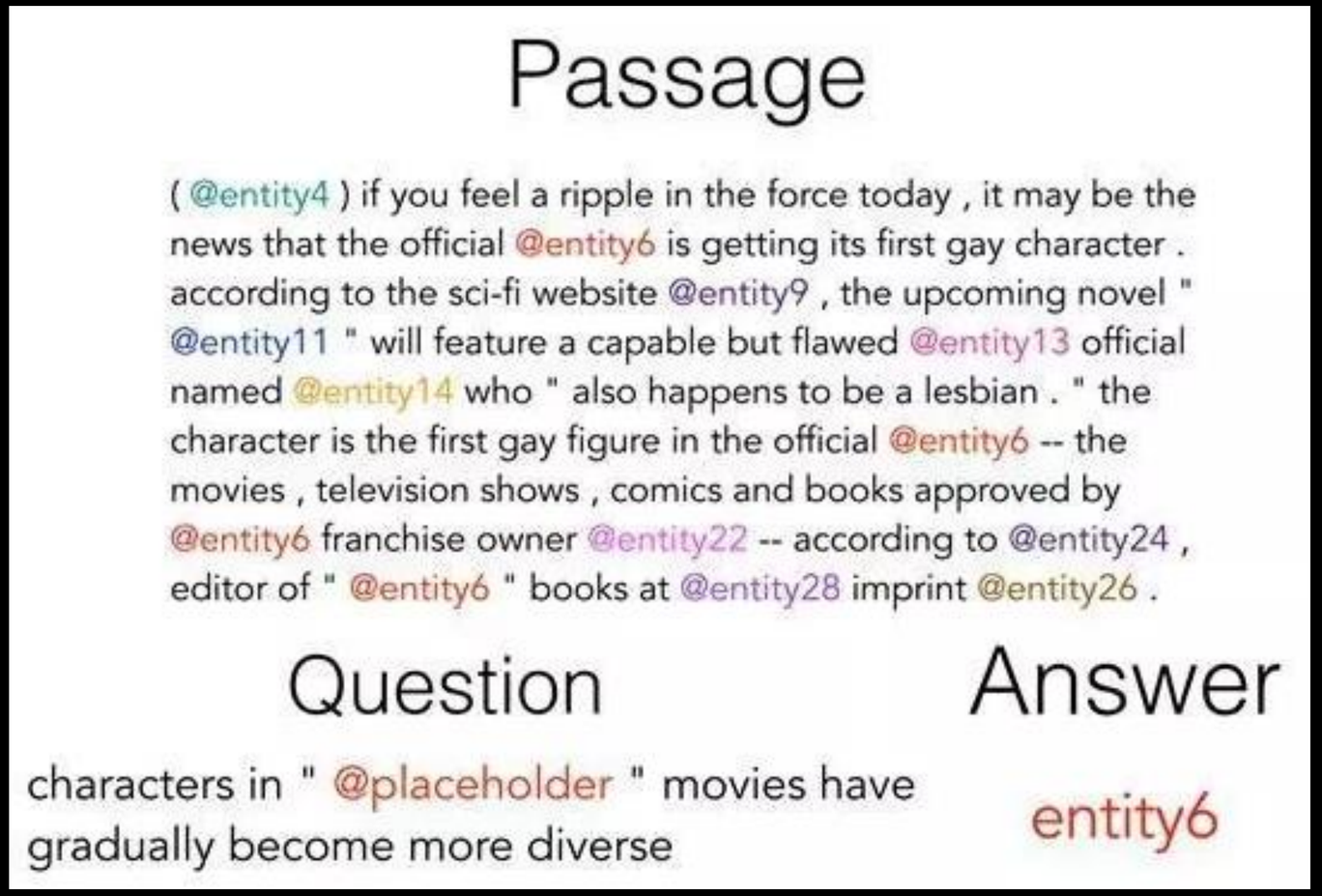

從閱讀到理解...

https://rajpurkar.github.io/SQuAD-explorer/



完詞型閱讀理解


Passage
(@entity4) if you feel a ripple in the force today , it may be the news that the official @entity6 is getting its first gay character . according to the sci-fi website @entity9 , the upcoming novel " @entity11 " will feature a capable but flawed @entity13 official named @entity14 who " also happens to be a lesbian . " the character is the first gay figure in the official @entity6 -- the movies , television shows , comics and books approved by @entity6 franchise owner @entity22 -- according to @entity24 , editor of " @entity6 " books at @entity28 imprint @entity26 .
Question
characters in " @placeholder " movies have gradually become more diverse
Answer
entity6

SQuAD閱讀理解

Article: Endangered Species Act
Paragraph: " . . . *Other legislation followed, including the Migratory Bird Conservation Act of 1929, a 1937 treaty prohibiting the hunting of right and gray whales, and the Bald Eagle Protection Act of 1940. These later laws had a low cost to society—the species were relatively rare—and little opposition was raised.*"

Question 1: "*Which laws faced significant opposition?*"
Plausible Answer: *later laws*

Question 2: "*What was the name of the 1937 treaty?*"
Plausible Answer: *Bald Eagle Protection Act*

Reasoning	Description	Example	Percentage
Negation	Negation word inserted or removed.	Sentence: "*Several hospital pharmacies have decided to outsource high risk preparations . . .* " Question: "*What types of pharmacy functions have* ***never*** *been outsourced?*"	9%
Antonym	Antonym used.	S: "*the extinction of the dinosaurs. . . allowed the tropical rainforest to spread out across the continent.*" Q: "*The extinction of what led to the* ***decline*** *of rainforests?*"	20%
Entity Swap	Entity, number, or date replaced with other entity, number, or date.	S: "*These values are much greater than the 9–88 cm as projected . . . in its Third Assessment Report.*" Q: "*What was the projection of sea level increases in the* ***fourth assessment report****?*"	21%
Mutual Exclusion	Word or phrase is mutually exclusive with something for which an answer is present.	S: "*BSkyB. . . waiv[ed] the charge for subscribers whose package included two or more premium channels.*" Q: "*What service did BSkyB* ***give away for free unconditionally****?*"	15%
Impossible Condition	Asks for condition that is not satisfied by anything in the paragraph.	S: "*Union forces left Jacksonville and confronted a Confederate Army at the Battle of Olustee. . . Union forces then retreated to Jacksonville and held the city for the remainder of the war.*" Q: "*After what battle did Union forces leave Jacksonville* ***for good****?*"	4%
Other Neutral	Other cases where the paragraph does not imply any answer.	S: "*Schuenemann et al. concluded in 2011 that the Black Death. . . was caused by a variant of Y. pestis. . .* " Q: "*Who* ***discovered*** *Y. pestis?*"	24%
Answerable	Question is answerable (i.e. dataset noise).		7%

該資料集包含 10 萬個（問題，原文，答案）三元組，原文來自於 536 篇維基百科文章

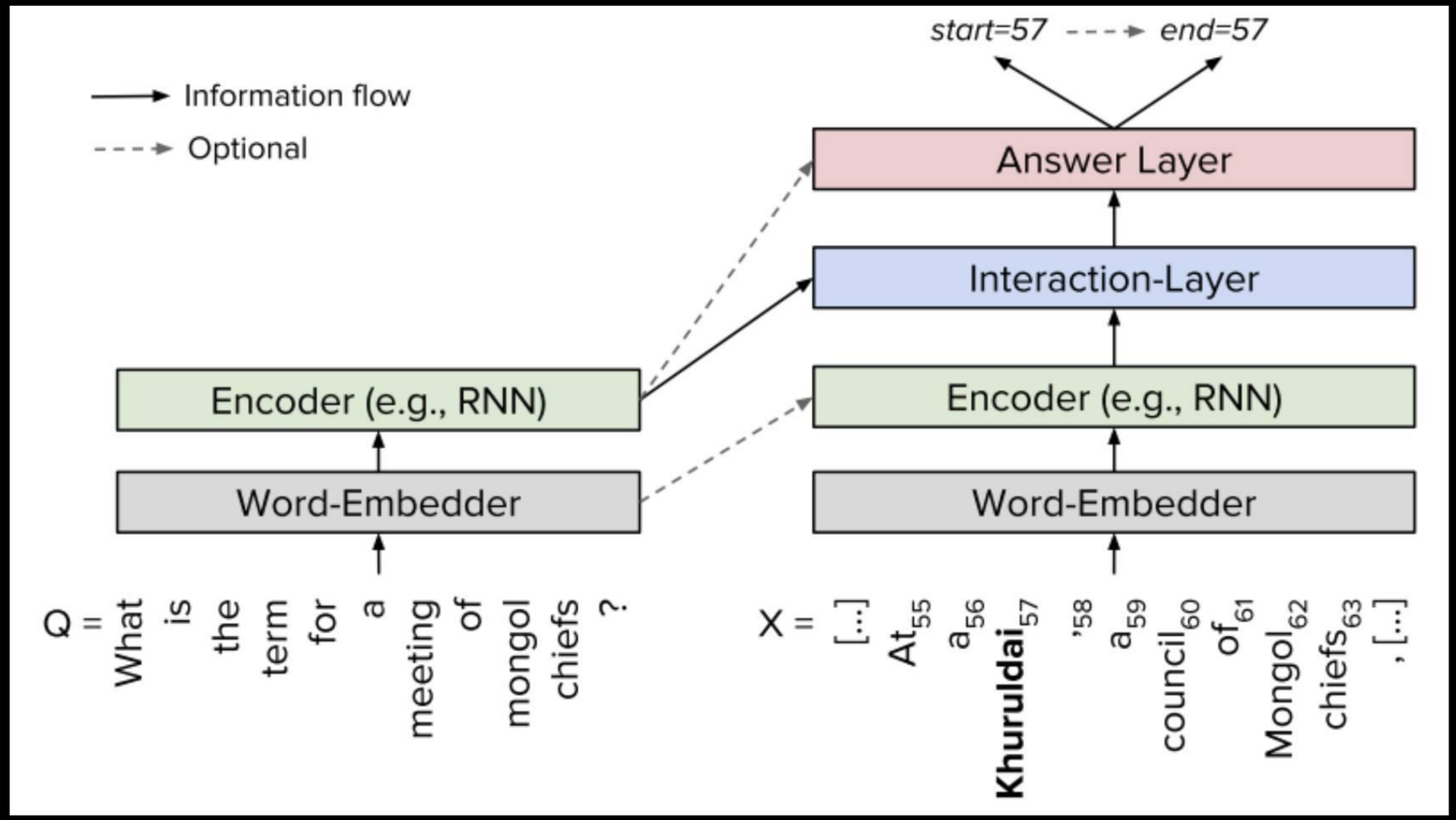
如果形式化地對閱讀理解任務和資料集進行描述的話，可以將該任務看作是四元組：

$$\langle D, Q, A, a \rangle$$

其中，D代表一篇文章，Q代表針對文章內容提出的一個問題，A是問題的正確答案候選集合，而a代表正確答案。對於選擇題類型來說，就是明確提供的答案候選集合而是其中的正確選項。對於人工合成任務以及完形填空任務來說，一般要求：

機器閱讀理解的評測維度分為 EM（Exact Match，精准匹配分數）和 F1（精確率和召回率的平均，模糊匹配分數）

閱讀理解的基本配方



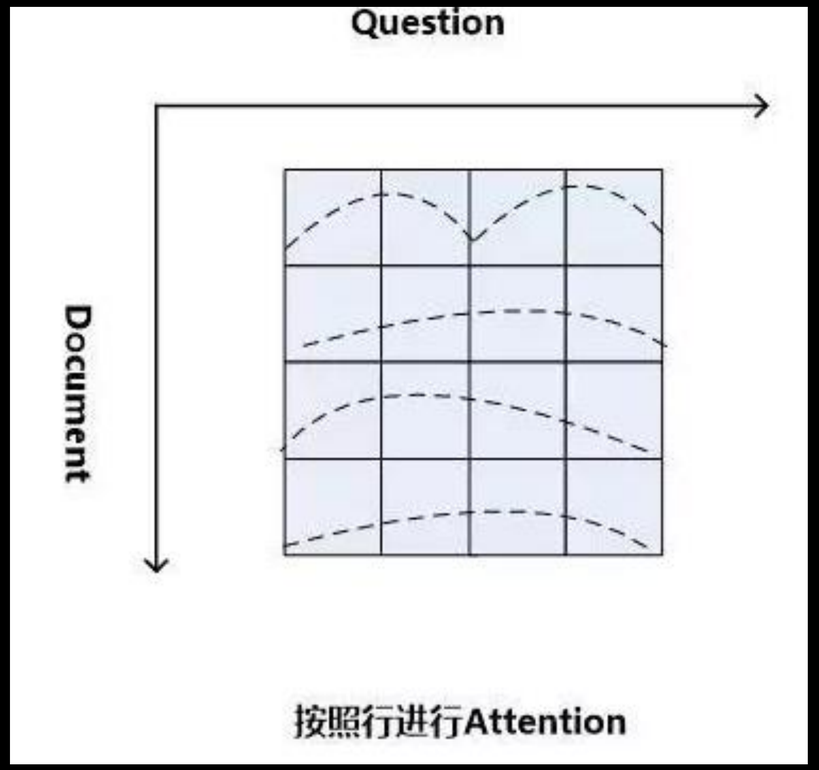
Embed 層將原文和問題中的 tokens 映射為向量表示

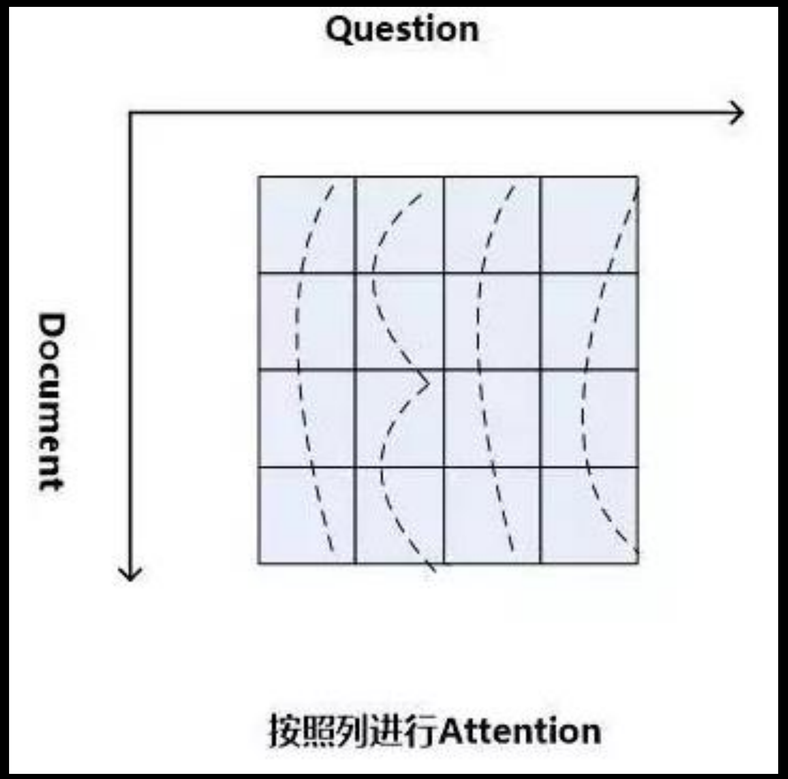
Encode 層對原文和問題進行編碼並上下文的語義資訊

Interaction 層負責捕捉問題和原文之間的交互關係，並輸出編碼了問題語義資訊的原文表示，即 query-aware 的原文表示

Answer 層則基於 query-aware 的原文表示來預測答案範圍

Encode 層對原文和問題進行編碼並上下文的語義資訊

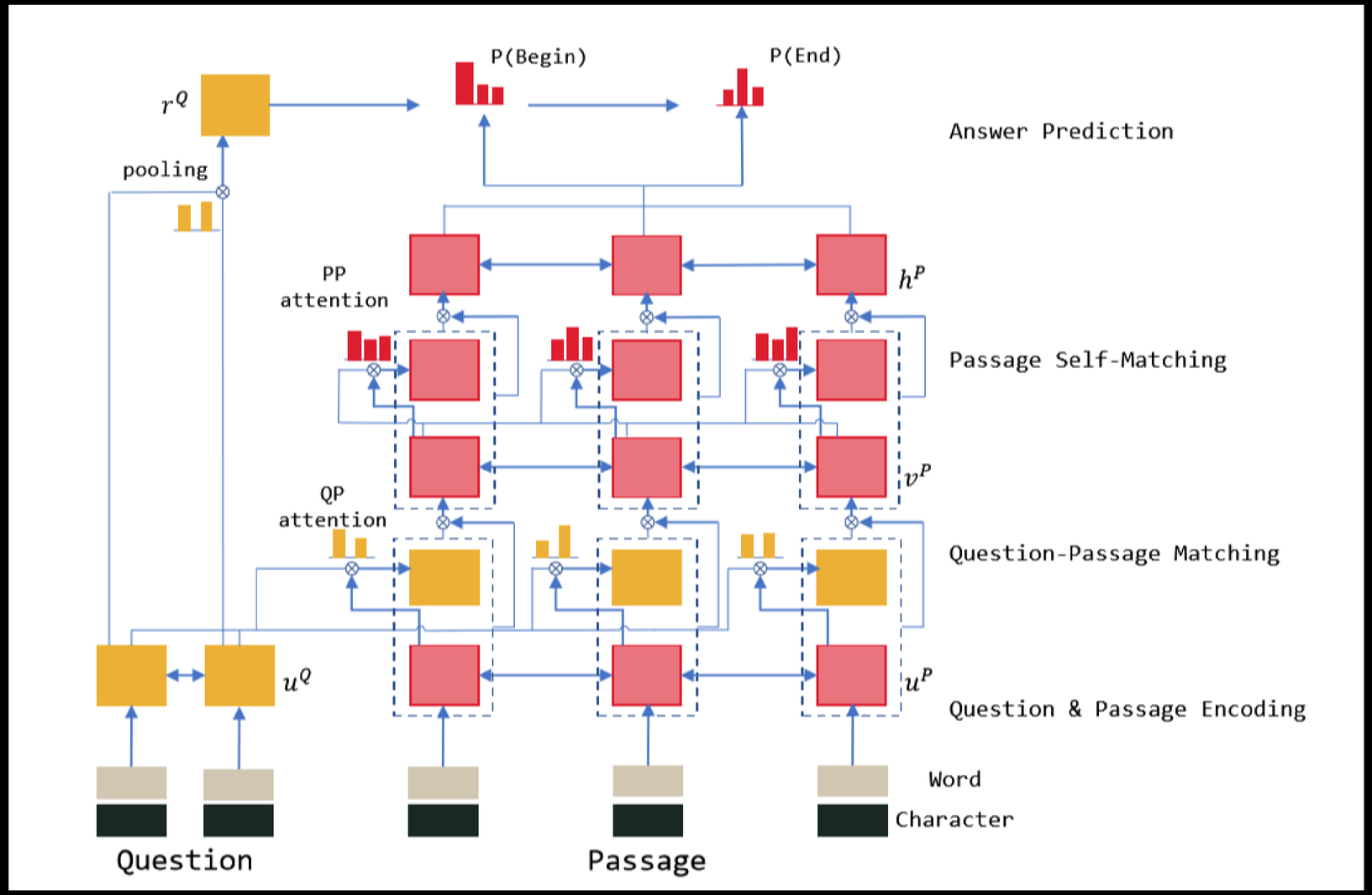


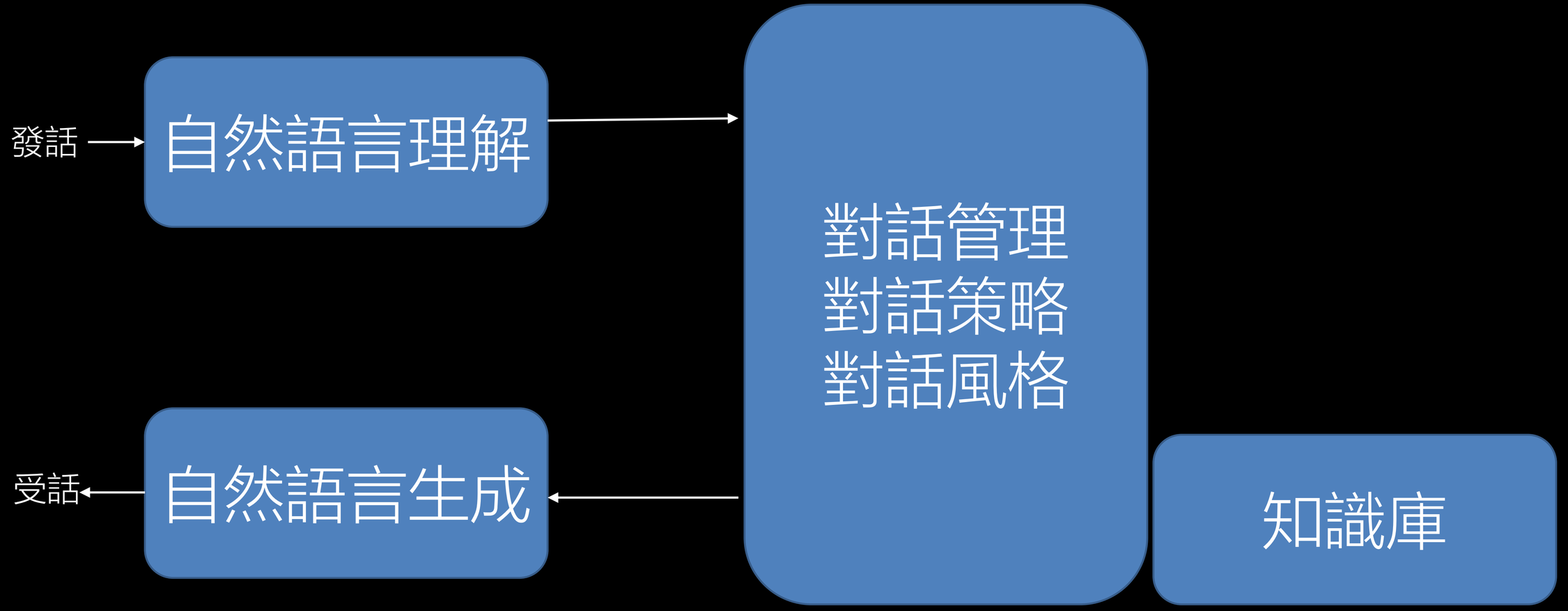


R-NET: MACHINE READING COMPREHENSION WITH SELF-MATCHING NETWORKS

https://www.microsoft.com/en-us/research/wp-content/uploads/2017/05/r-net.pdf

微軟亞洲研究院的 R-NET 模型在 EM 值（表示預測答案和真實答案完全匹配）上以 82.650 的成績率先超過人類（82.304）




發話
自然語言理解
對話管理
對話策略
對話風格
知識庫
受話
自然語言生成

方法	模型	語意	適合條件	應用
基於分析	分類或結構預測	顯式	回復的集合是固定的	語音助手
基於檢索	匹配	部分	回復的集合是開放的	智能問答
基於生成	生成或翻譯	隱式	端到端轉換	聊天

Neural Symbolic Machines: Learning Semantic Parsers on Freebase with Weak Supervision

https://arxiv.org/abs/1611.00020

key-variable memory

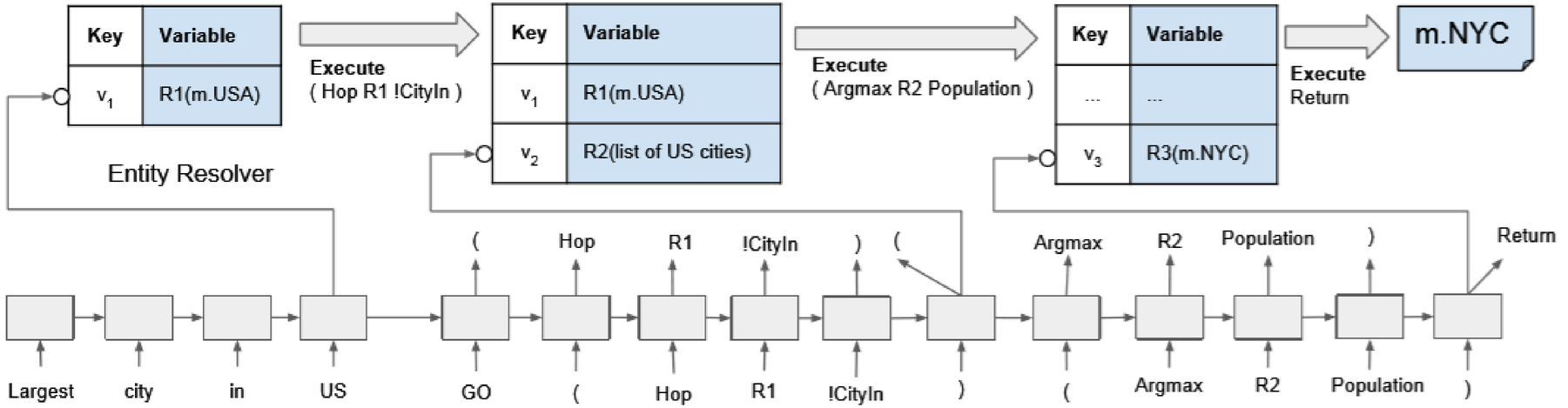
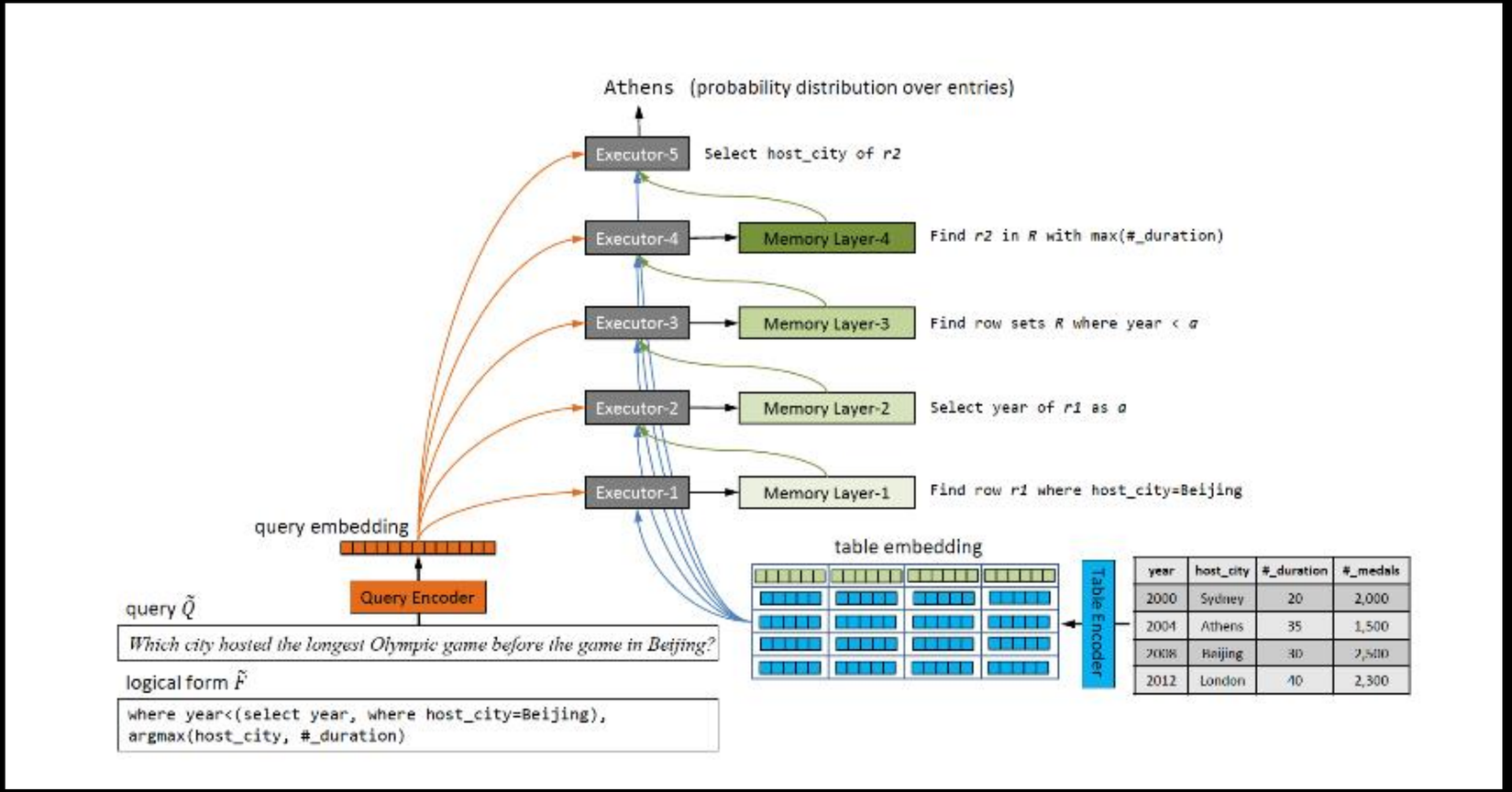


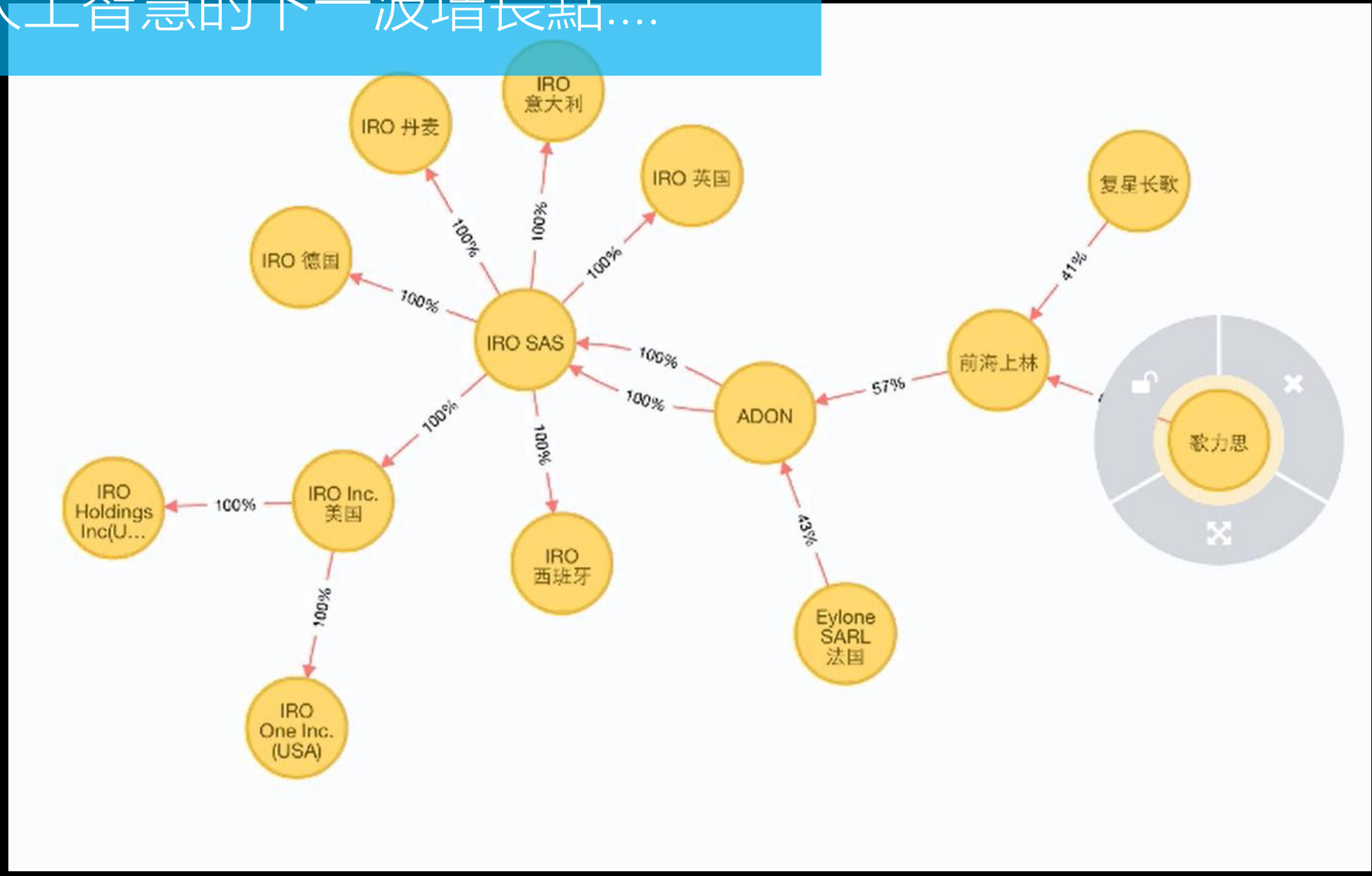
Figure 2: Semantic Parsing with NSM. The key embeddings of the key-variable memory are the output of the sequence model at certain encoding or decoding steps. For illustration purposes, we also show the values of the variables in parentheses, but the sequence model never sees these values, and only references them with the name of the variable ("R_1"). A special token "*GO*" indicates the start of decoding, and "*Return*" indicates the end of decoding.

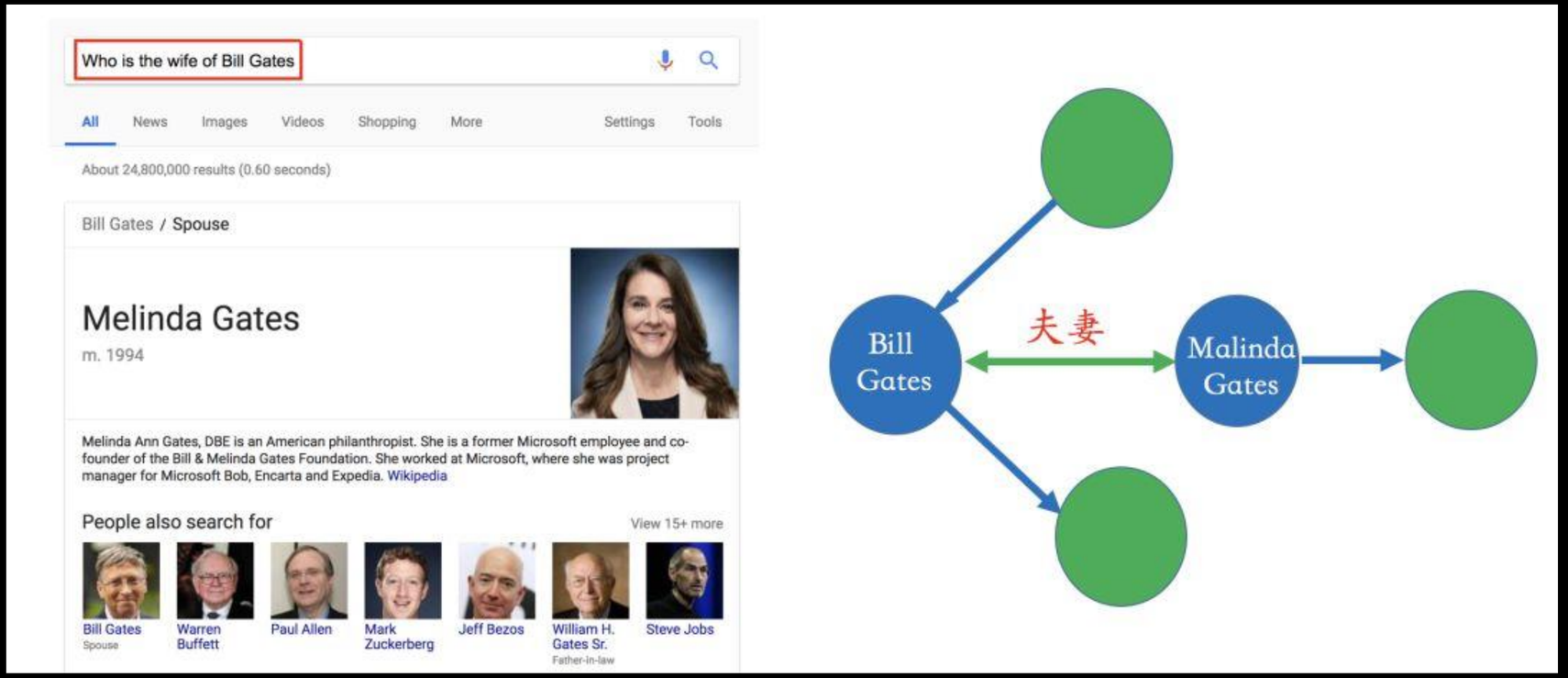
Neural Enquirer: Learning to Query Tables with Natural Language

https://arxiv.org/abs/1512.00965

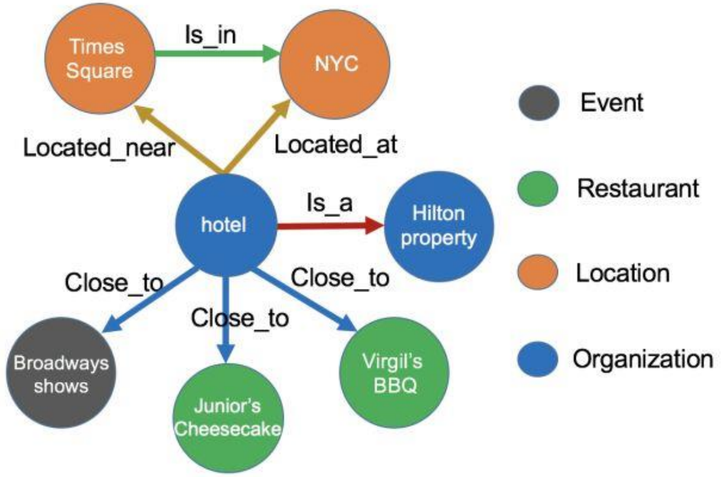


透過自然語言來整理知識圖譜
而知識圖譜再透過自然語言進行推理
這將會是人工智慧的下一波增長點....





This hotel is my favorite Hilton property in NYC! It is located right on 42nd street near Times Square in New York, it is close to all subways, Broadways shows and next to great restaurants like Junior's Cheesecake, Virgil's BBQ

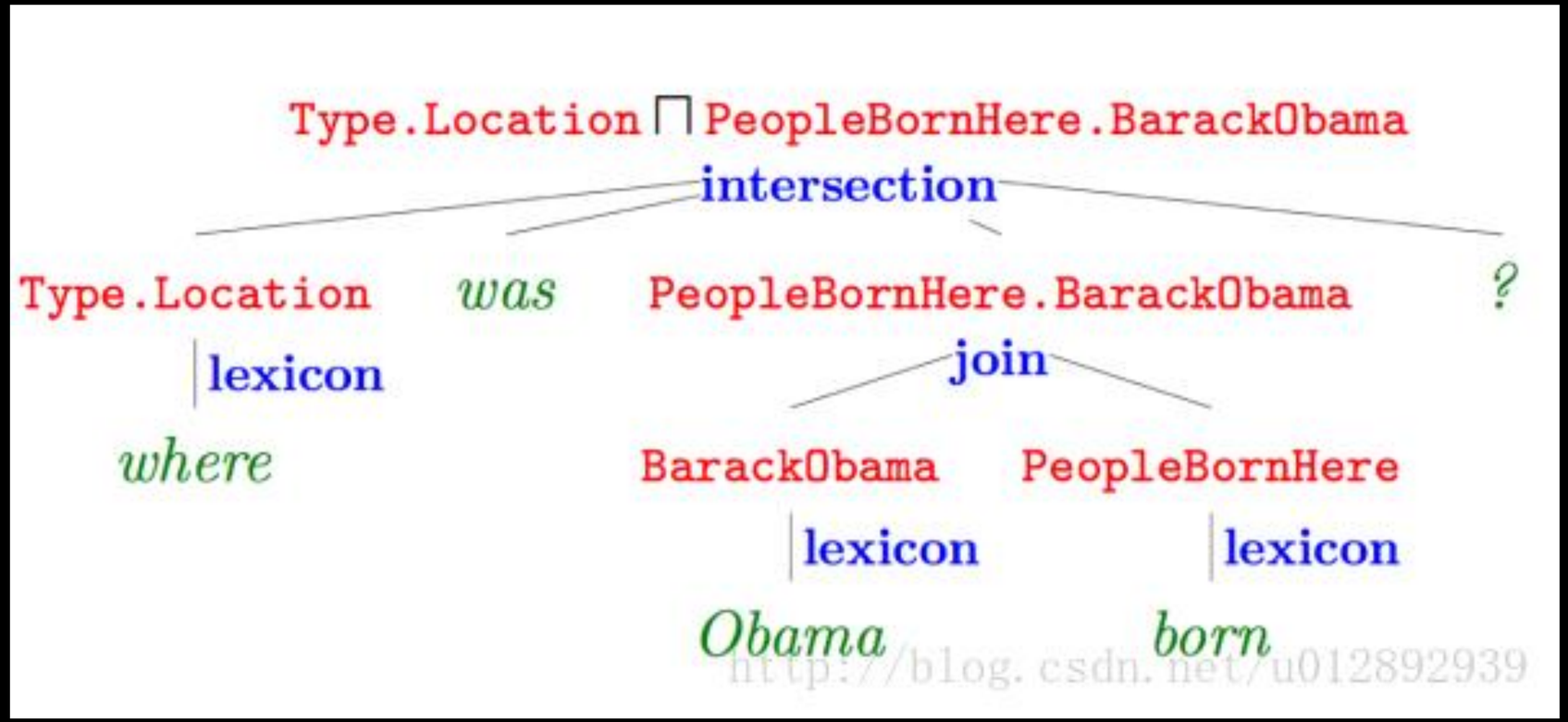


實體統一

紙袋消解


This hotel is my favorite Hilton property in NYC! It is located right on 42nd street near Times Square in New York, it is close to all subways, Broadways shows and next to great restaurants like Junior's Cheesecake, Virgil's BBQ
This hotel is my favorite Hilton property in NYC! It is located right on 42nd street near Times Square in New York, it is close to all subways, Broadways shows,and next to great restaurants like Junior's Cheesecake, Virgil's BBQ

傳統作法：語意解析



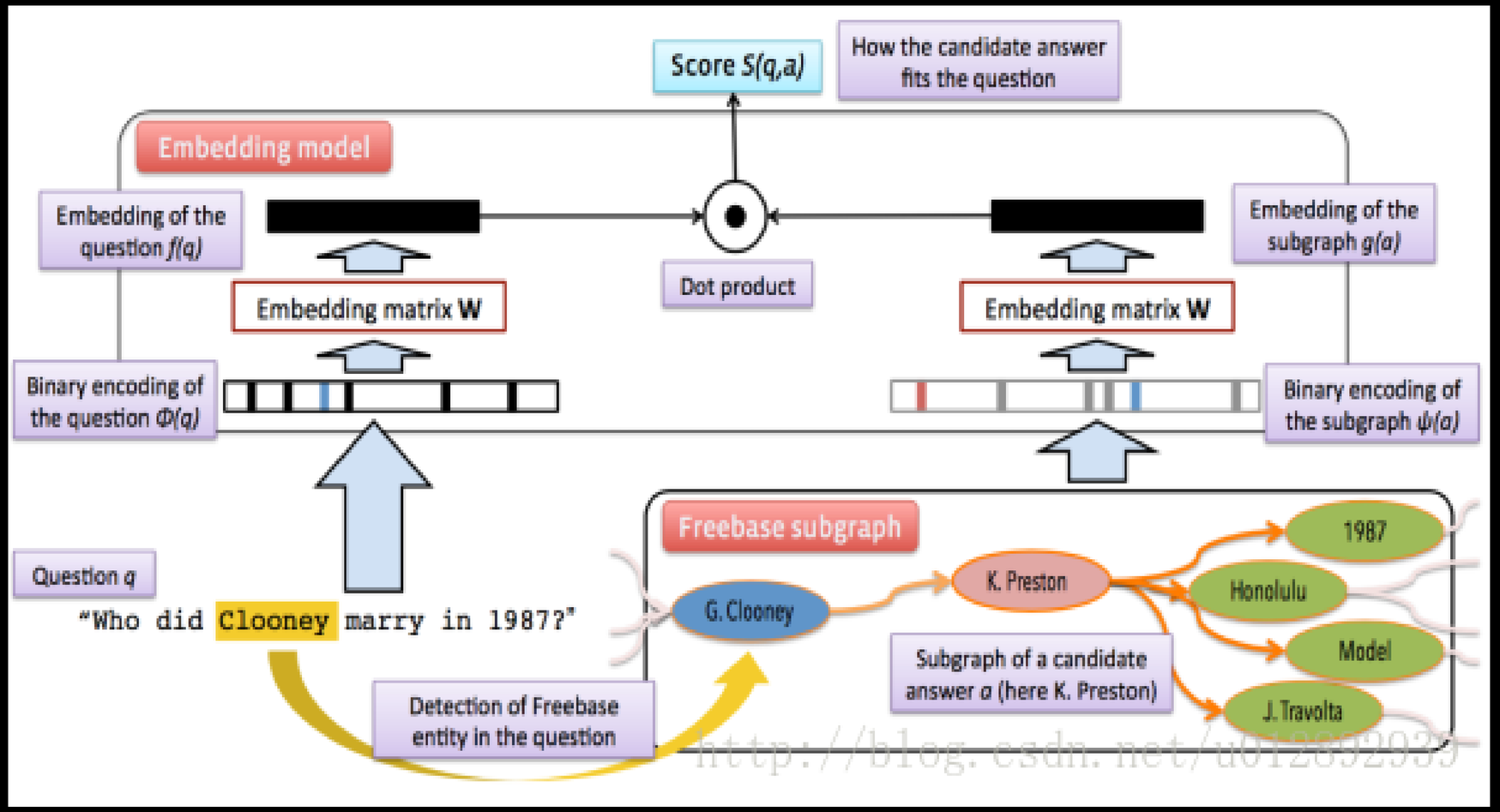
詞向量作法

1.　進行語意類比
2.　找尋語意實體清單(2個案例)
3.　找尋語意實體清單(3個案例)
4.　找尋語意實體清單(2個案例+排除案例)
5.　語意加法
6.　語義減法
2請依序輸入兩個同類別的參考詞彙
請輸入詞彙1:
美金
請輸入詞彙2:
英鎊

其他與這些詞彙同類別的詞包括：
美元　1.57898909450888
歐元　1.53256226019339
鎊　1.44298852328179
日元　1.32367640292132
英磅　1.30289098420964
澳元　1.24259902716915
韓元　1.22951740439847
人民幣　1.20963154530402
盧比　1.2019210505803
澳幣　1.16238767016925
比索　1.16231691449013
美圓　1.13206933607866
盧布　1.12043164900812
加元　1.10499273791029
臺幣　1.09375760098576

1請依序輸入 A:B=C:回傳值
請輸入詞彙A:
基金
請輸入詞彙B:
贖回
請輸入詞彙C:
期貨
您所要比對的關係式為 基金 : 贖回 = 期貨 : 回傳值
平倉　0.516610542842957
套保　0.506149640639202
交割　0.478613197915662
期市　0.462535558497712
限倉　0.457934543510518
現貨　0.451382415722367
交收　0.448342951914932
賣空　0.43804887719448
外盤　0.437957872837664
期指　0.436827618790929

深度學習作法


Score S(q,a)
How the candidate answer fits the question
Embedding model
Embedding of the question f(q)
Embedding of the subgraph g(a)
Dot product
Embedding matrix W
Embedding matrix W
Binary encoding of the question Φ(q)
Binary encoding of the subgraph ψ(a)
Freebase subgraph
Question q
"Who did Clooney marry in 1987?"
G. Clooney
K. Preston
1987
Honolulu
Model
J. Travolta
Subgraph of a candidate answer a (here K. Preston)
Detection of Freebase entity in the question
http://blog.csdn.net/u012832937

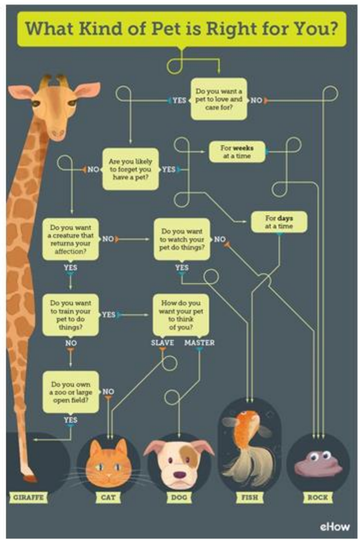
中文視覺智慧問答
CVQA

在图中有几只狗? (6只)
2/10

在图中有几只狐狸? (5只)
2/10

图中的狐狸是在哪种物体上? (提包)
2/10

在图中有几只狗? (1只)
3/10



从左数来第1只是哪种动物?(长颈鹿)
4/10

图中的鬣狗是在哪种场景中?(室内)
9/10

图中的长颈鹿是在哪种场景中?(室内)
9/10

图中的长颈鹿是在哪种场景中?(雪地)
7/10

图中的天竺鼠是在哪种场景中?(雪地)
5/10

賽題例句

圖中的{動物}是在哪種物體上?

圖中的{物體}上印的是哪種動物?

圖中的{動物}是在哪種場景中?

圖中出現的是哪種動物?

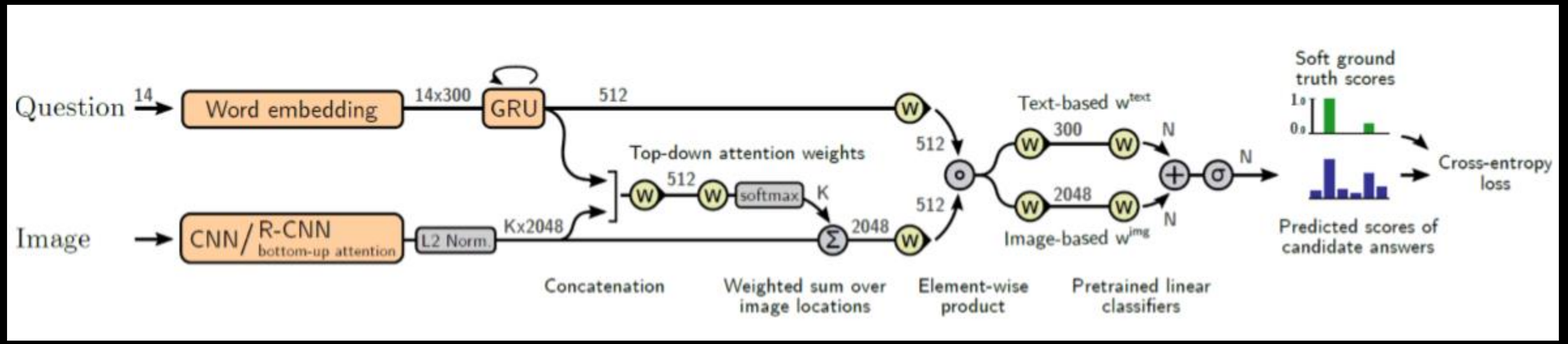
在圖中{動物1}是出現在{動物2}的哪一邊?

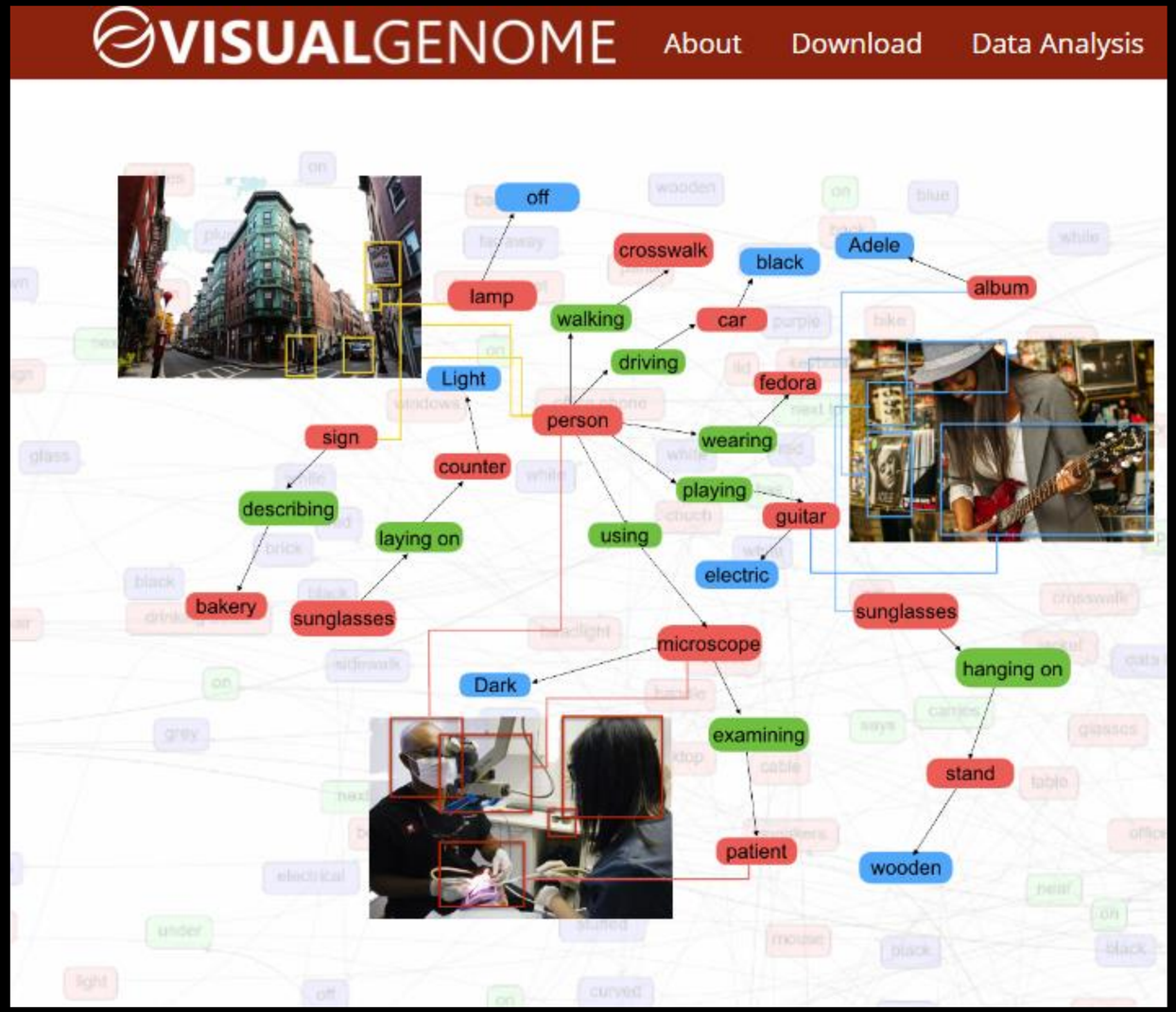
在圖中有幾隻{動物}?

在圖中{顏色}的{動物}有幾隻?

從{左邊，右邊}數來第{n}只是哪種動物?

VQA的典型結構


Question
14
Word embedding
14x300
GRU
512
Image
CNN / R-CNN
bottom-up attention
L2 Norm.
Kx2048
Top-down attention weights
512
W
softmax
K
2048
512
512
Text-based w^text
300
2048
Image-based w^img
N
N
N
Soft ground truth scores
1.0
0.0
Cross-entropy loss
Predicted scores of candidate answers
Concatenation
Weighted sum over image locations
Element-wise product
Pretrained linear classifiers


VISUALGENOME
About
Download
Data Analysis
off
lamp
crosswalk
walking
black
car
Adele
album
driving
Light
fedora
person
wearing
sign
counter
playing
describing
guitar
laying on
using
electric
bakery
sunglasses
microscope
sunglasses
hanging on
Dark
examining
stand
patient
wooden


Q&A

https://notebooks.azure.com/allanyiin/libraries/dl12

Dl12 理解你的意圖


今日黑科技