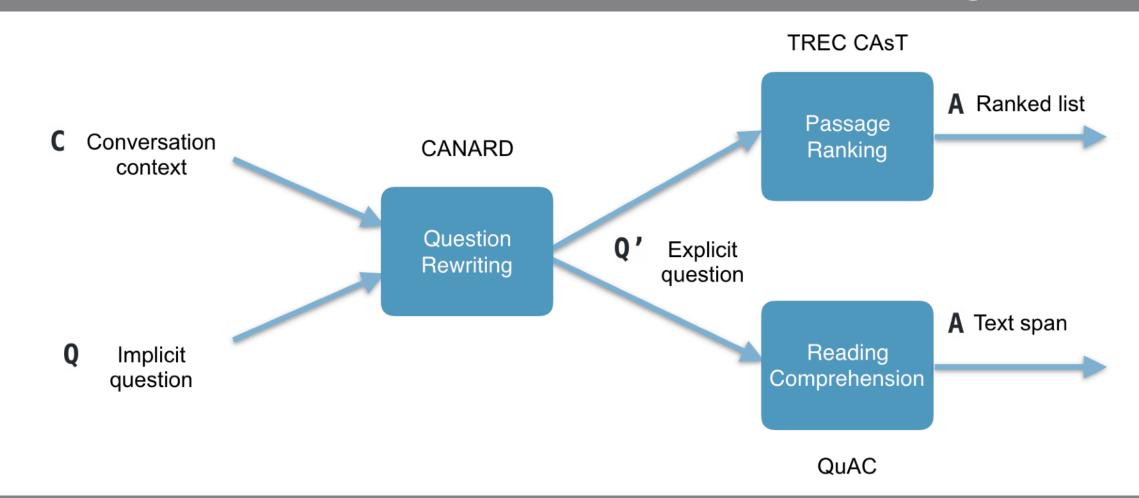# Question Rewriting for Conversational Question Answering
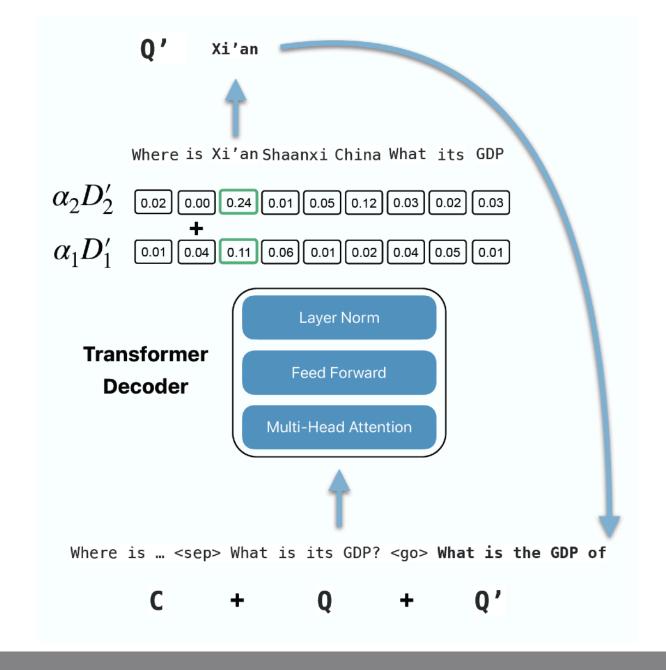
Svitlana Vakulenko[1], Shayne Longpre[2], Zhucheng Tu[2], Raviteja Anantha[2]

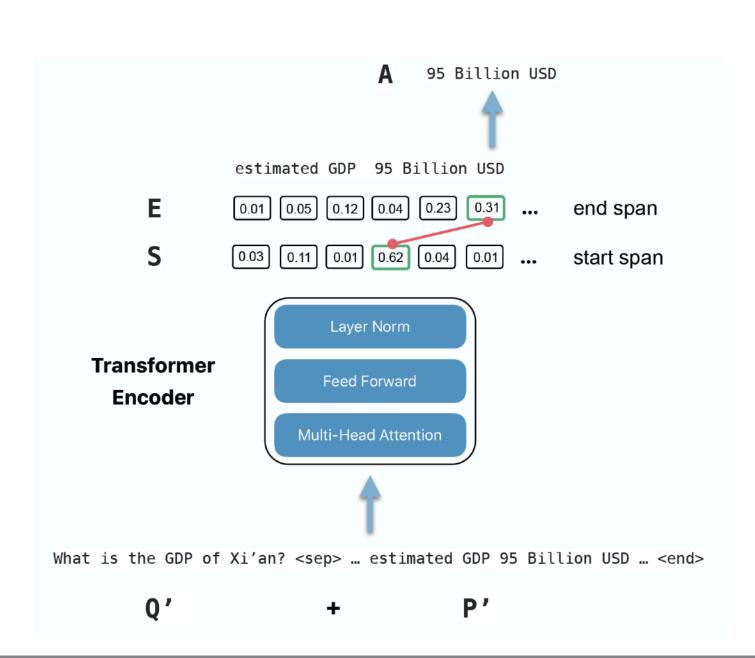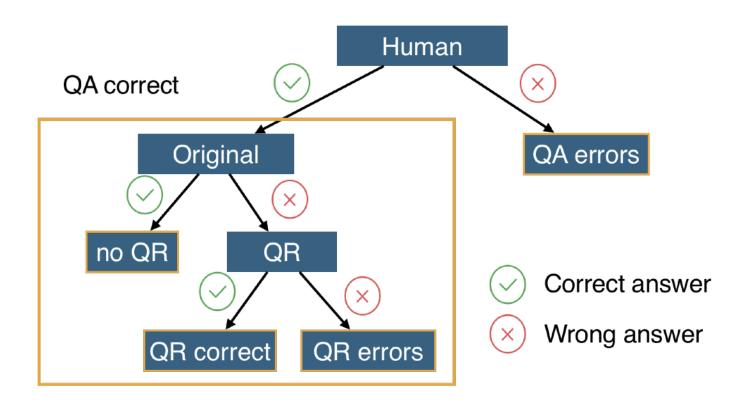[1]University of Amsterdam, [2]Apple Inc.

Conversational Question Answering

Question Rewriting

Reading Comprehension

Error Analysis

QR	Human	ROUGE-1 R	R@1000
How is intermittent fasting related to keto *diet*	How is intermittent fasting related to keto?	1	0.48
What's the biggest great whites *ever caught*	What about for great whites?	0.6	1

QR	Human	ROUGE-1 R	Jaccard
was *kick out the jams* well received?	was Kick Out the Jams well received?	1	0.03
did *he do anything else*?	did Guy Lombardo have any other career highlights besides racing and the restaurant?	0.08	1

Original	QR	Human	P@1		NDCG@3	
			= 1	> 0	≥ 0.5	= 1
✗	✗	✗	49 (14)	10 (1)	55 (20)	154 (49)
✓	✗	✗	0	0	0	0
✗	✓	✗	2	0	1	0
✓	✓	✗	0	1	1	0
✗	✗	✓	19	10	25	4
✓	✗	✓	0	1	0	0
✗	✓	✓	48	63	47	11
✓	✓	✓	55 (37)	88 (52)	44 (33)	4 (4)
Total						173 (53)

Original	QR	Human	F1 > 0	F1 ≥ 0.5	F1 = 1
✗	✗	✗	847 (136)	1855 (235)	2701 (332)
✓	✗	✗	174	193	181
✗	✓	✗	19	35 (2)	40 (1)
✓	✓	✗	135	153	120
✗	✗	✓	141	288	232
✓	✗	✓	65 (1)	57 (1)	40
✗	✓	✓	226	324	269
✓	✓	✓	3964 (529)	2666 (428)	1988 (333)
Total					5571 (666)

https://github.com/svakulenk0/QRQA