

微信智言

演讲者 牛成

new trend
new technology
new application

Cloud + community
Developer conference

内容页

- 腾讯小微
- 对话系统
- 案例介绍
- 期待与展望

并不是一个单一的对话模型，而是**专门为合作伙伴设计的**，以对话为核心能力的，易于接入的**开放式平台**



腾讯云小微

连接人与应用

源自微信 & 腾讯云

直接提供对多个高频对话场景的完整支持

用户随心自定义场景，实时生效

精准的语义理解能力为所有场景服务

来自腾讯生态伙伴的深度支持

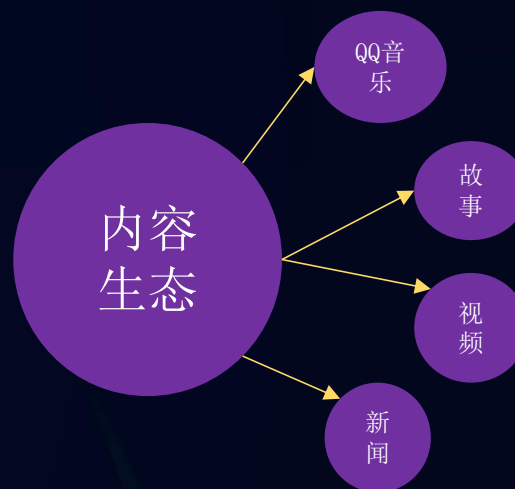
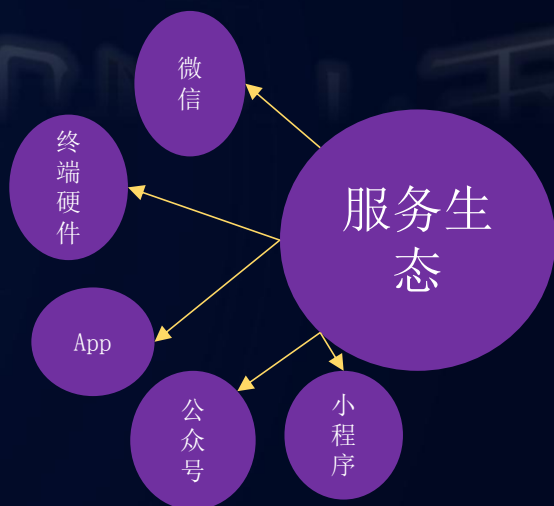


腾讯云小微

腾讯云小微

小微

无微不至



对话系统由来已久，可以分为3个阶段。最早从1966年就有人开始尝试基于规则的对话系统。到了2010年左右，数据驱动系统兴起，包括信息检索技术和机器学习模型，尤其是机器翻译模型开始被用在对话系统上。近年，人们开始尝试，用对话系统真正去解决现实中的问题，即使还只是一小部分。



不只是一个对话系统，而是一个四位一体的平台组

平台

内容

产品生态

腾讯云小微

对话系统

对话平台

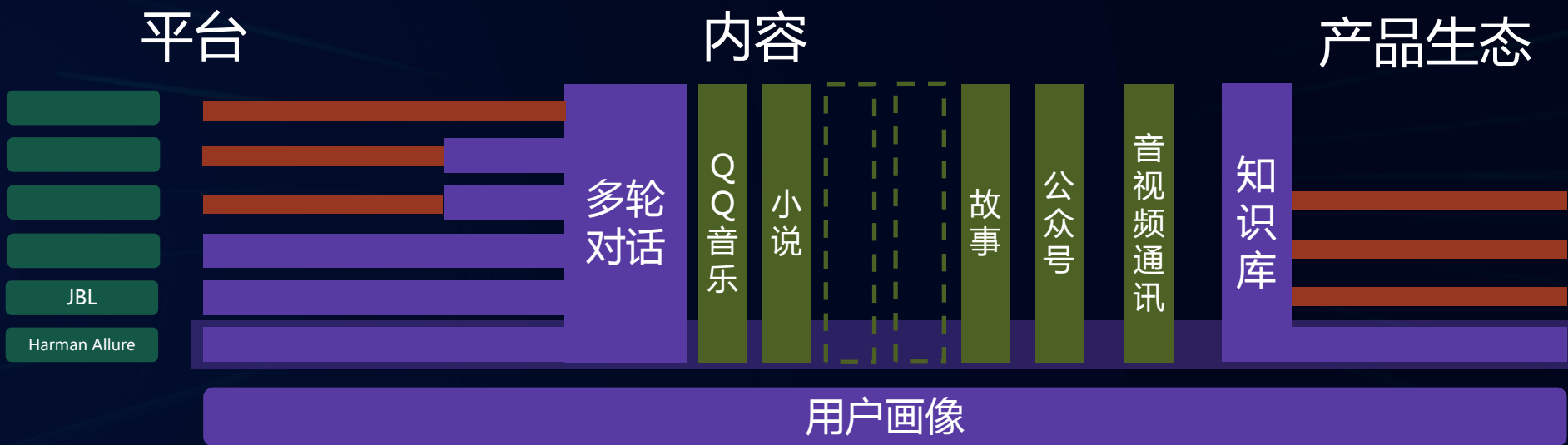
对话模型

NLU
DM
NLG

内容平台

自定义能力平台

不只是一个对话系统，而是一个四位一体的平台组



小微

无微不至

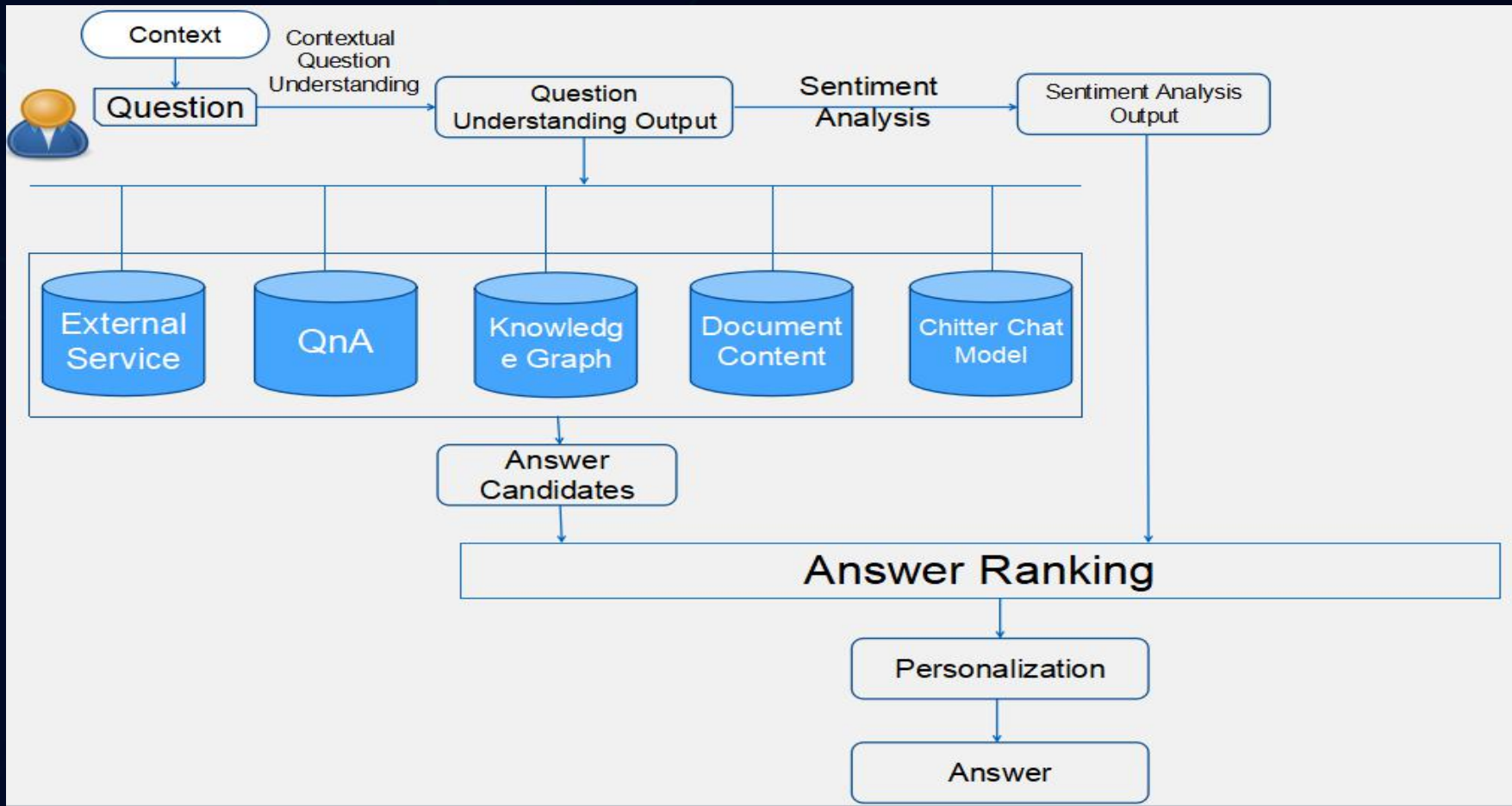
语义理解
系统

精准的单意图识别和多意图处理

对话流程中的关键词(槽位)处理

多轮对话管理（系统自带与用户自定义）

用户问题处理流程



意图分类

意图反映用户需求，在对话系统中，每一个意图都与现实世界中的某个需求点对应。

用户实际需求

明天天气怎么样
下午三点打球
腾讯股票价格
放首歌听听
停止播放
下一首

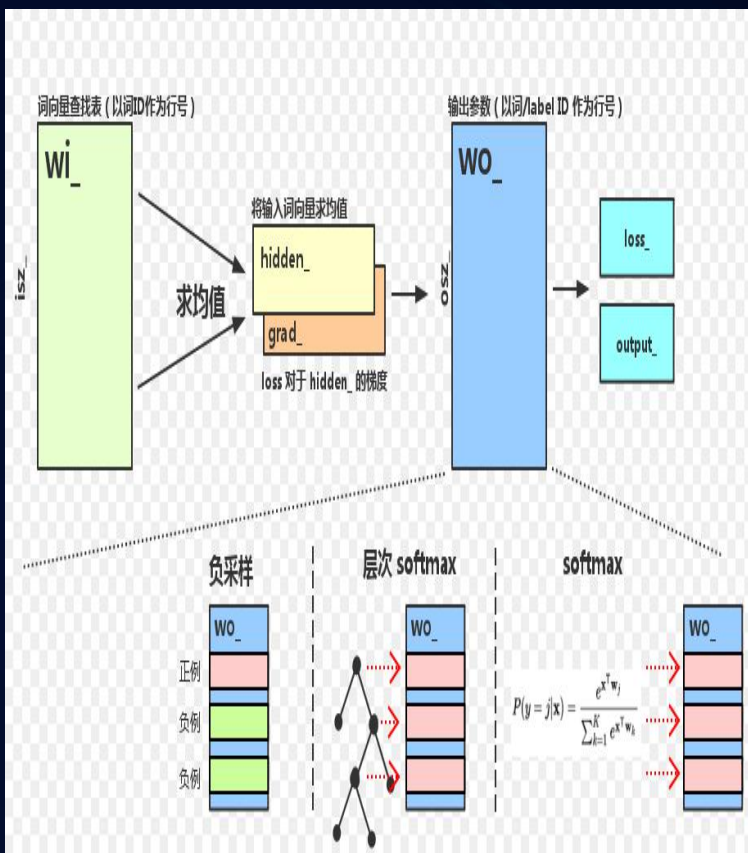
多级意图

天气
提醒
股票
音乐
停止
下一个 指令

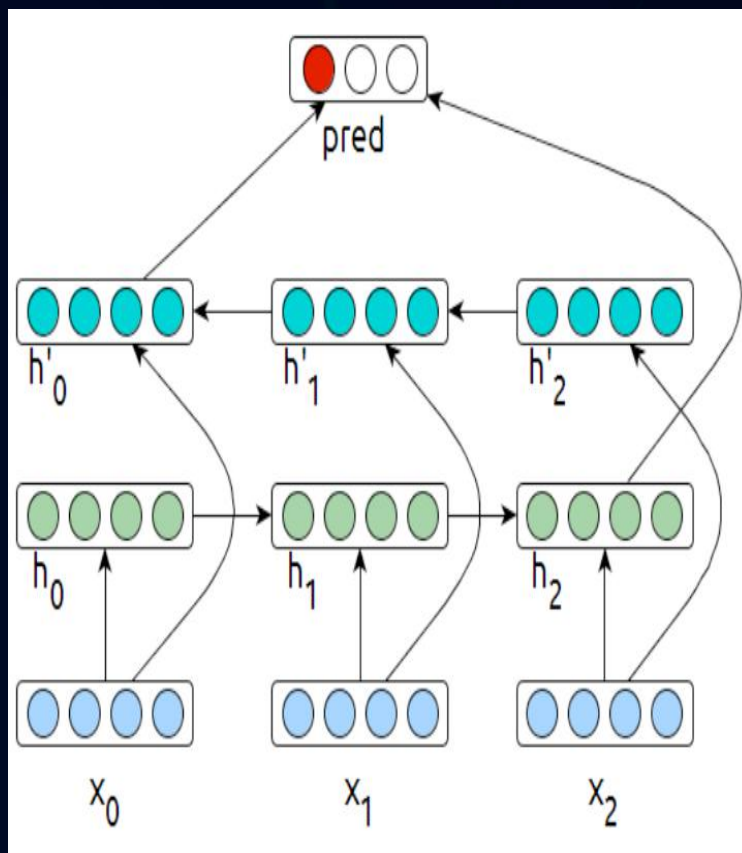
系统模型结构



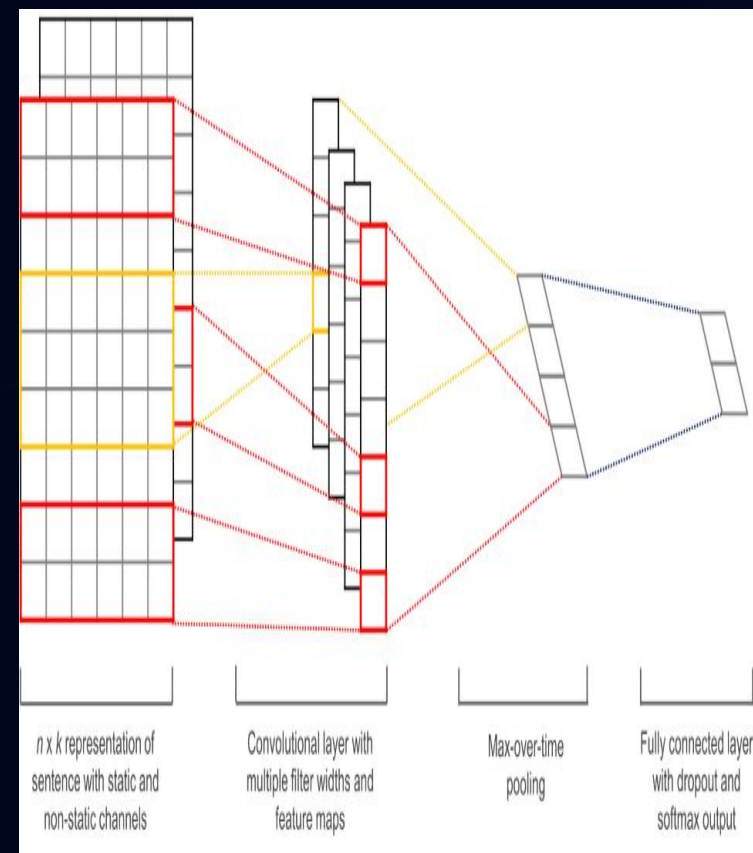
Typical Models for Intent Classification



Fasttext



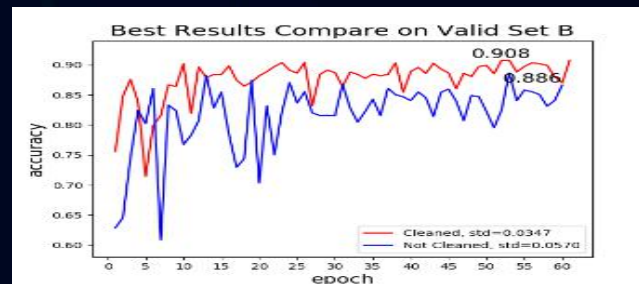
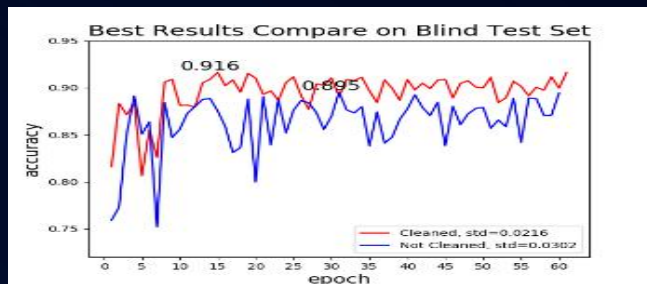
RNN for text classification



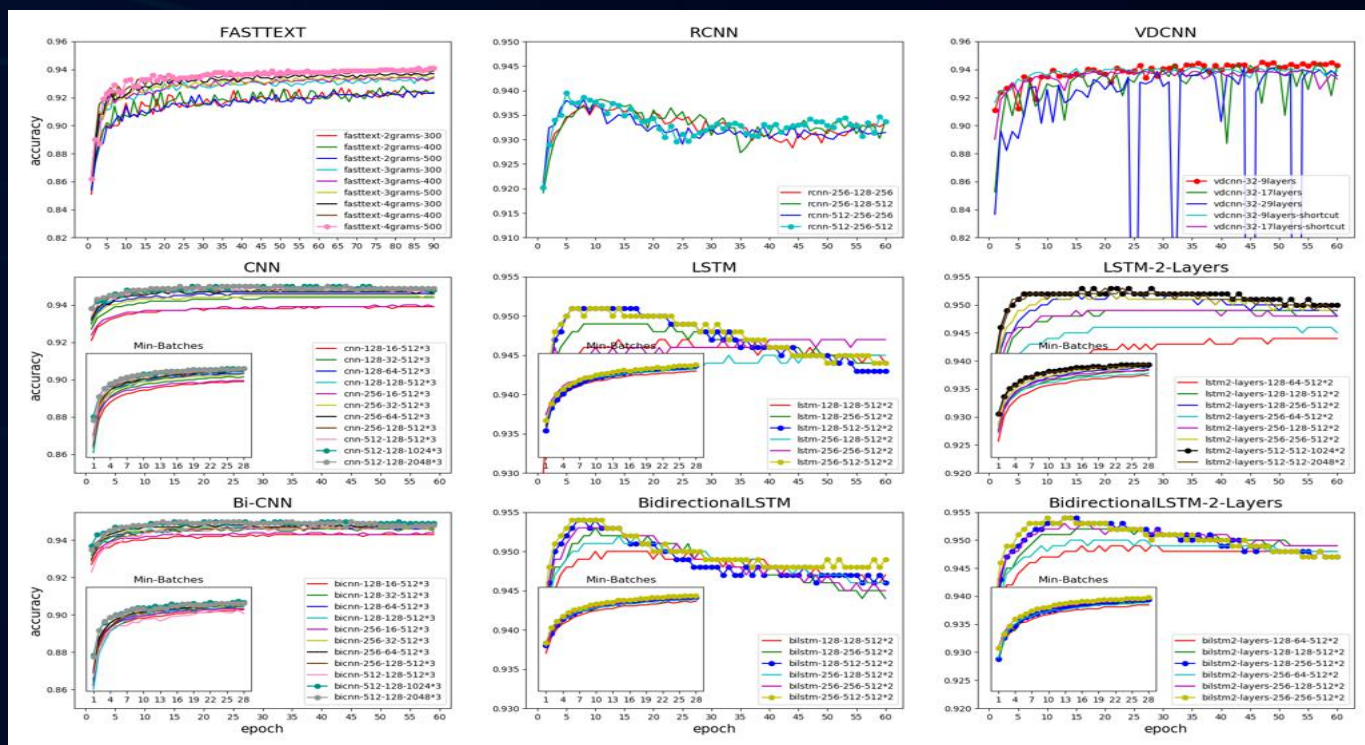
CNN for text classification

模型效果比对

数据准备
数据清洗



模型规模
参数调整



参数精调：
Pre-Train, Learning Rate,
Batch Size, Regularization

用户问题指代消解

$$q' = H(q, C)$$

Input:

q: 当前Query
c: 上下文

Output:

q': 指代消解后的Query

About 5% of the total queries

Examples:

C1: 你是**陈奕迅**粉丝吗?

C2: 更喜欢**张学友**

q: 为什么更喜欢**他**?

q': 为什么更喜欢**张学友**

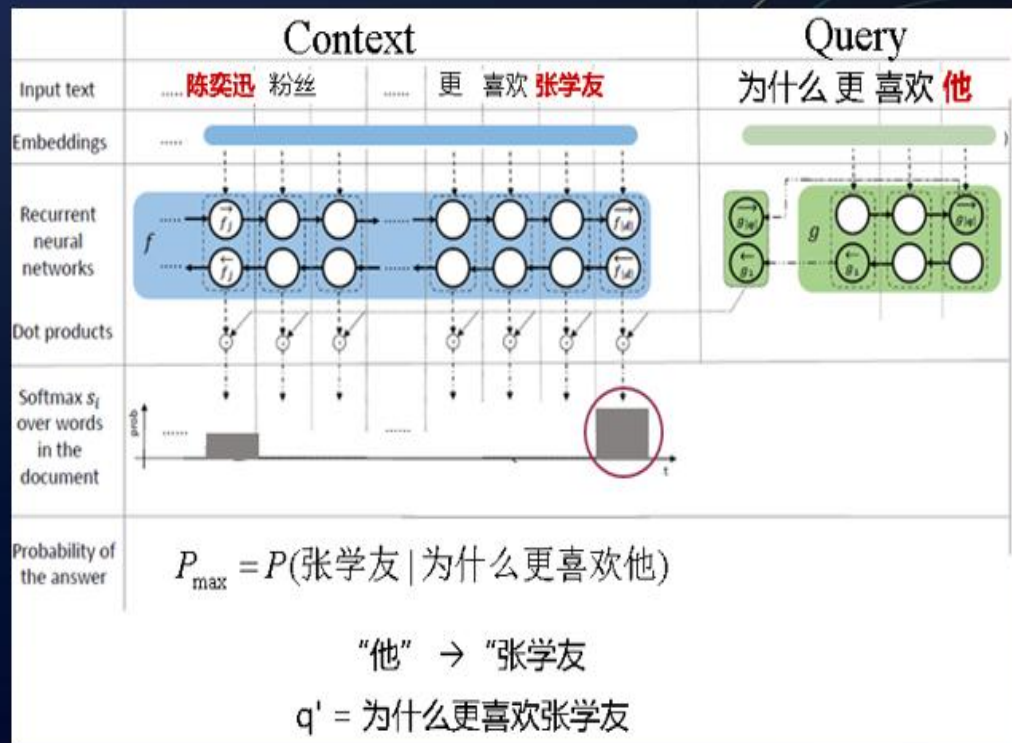
C1: 你住哪儿?

C2: **不二寺**。

q: **那**在哪儿?

q': **不二寺**在哪儿?

- 100K training data
- Accuracy: 90%
- Majority of the errors are caused by the mistakes of entity tagging



DSTCT7 Flex Dataset

Example partial dialogue:

ADVISOR / Hi! What can I help you with?
STUDENT / Hello! I'm trying to schedule classes for next semester. Can you help me?
STUDENT / Hardware has been an interest of mine.
STUDENT / But I don't want too hard of classes
ADVISOR / So are you interested in pursuing Electrical or Computer Engineering?
STUDENT / I'm undecided
STUDENT / I enjoy programming but enjoy hardware a little more.
ADVISOR / Computer Engineering consists of both programming and hardware.
ADVISOR / I think it will be a great fit for you.
STUDENT / Awesome, I think that's some good advice.
STUDENT / What classes should I take to become a Computer Engineer?
ADVISOR / You haven't taken EECS 203, 280, and 270, so it may be in your best interest to take one or two of those classes next semester
STUDENT / Ok. Which of those is in the morning. I like morning classes

Example Candidate set:

Twenty next utterance options, correct ones shown in bold:

- *Is there anything else I can help answer?*
- ***They have not released the plans for next semester yet.***
- *Do you have an interest in this class?*
- *Do you find this class interesting?*
- *Does this course interest you?*
- *It wouldn't be smart to combine 381 with another EECS course, unless you like to stay up late*

Knowledge sources

PRIOR COURSEWORK & DESCRIPTIONS

Course ID	Course Name	Instructor	Semester	Year
EECS 203	Introduction to Computer Systems	Dr. [Name]	Fall	2014
EECS 280	Computer Architecture	Dr. [Name]	Fall	2014
EECS 270	Computer Organization	Dr. [Name]	Fall	2014
EECS 381	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 382	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 383	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 384	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 385	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 386	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 387	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 388	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 389	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 390	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 391	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 392	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 393	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 394	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 395	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 396	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 397	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 398	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 399	Advanced Computer Architecture	Dr. [Name]	Fall	2014

SUGGESTED COURSEWORK & DESCRIPTIONS

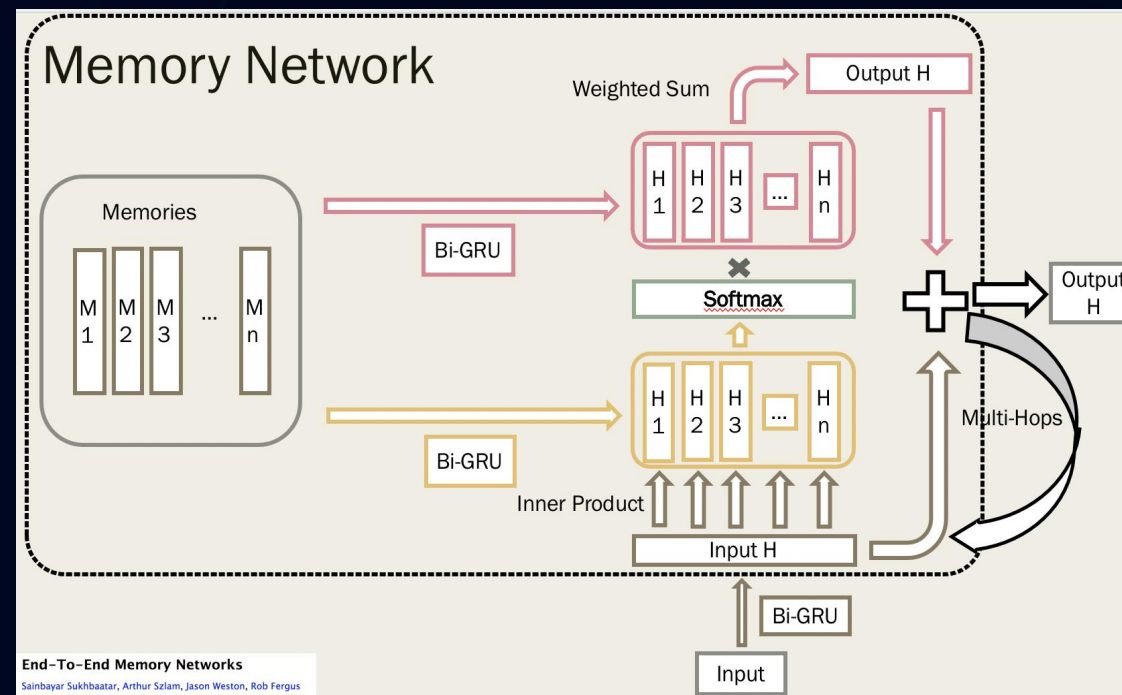
Course ID	Course Name	Instructor	Semester	Year
EECS 203	Introduction to Computer Systems	Dr. [Name]	Fall	2014
EECS 280	Computer Architecture	Dr. [Name]	Fall	2014
EECS 270	Computer Organization	Dr. [Name]	Fall	2014
EECS 381	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 382	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 383	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 384	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 385	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 386	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 387	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 388	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 389	Advanced Computer Systems	Dr. [Name]	Fall	2014
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EECS 391	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 392	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 393	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 394	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 395	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 396	Advanced Computer Architecture	Dr. [Name]	Fall	2014
EECS 397	Advanced Computer Organization	Dr. [Name]	Fall	2014
EECS 398	Advanced Computer Systems	Dr. [Name]	Fall	2014
EECS 399	Advanced Computer Architecture	Dr. [Name]	Fall	2014

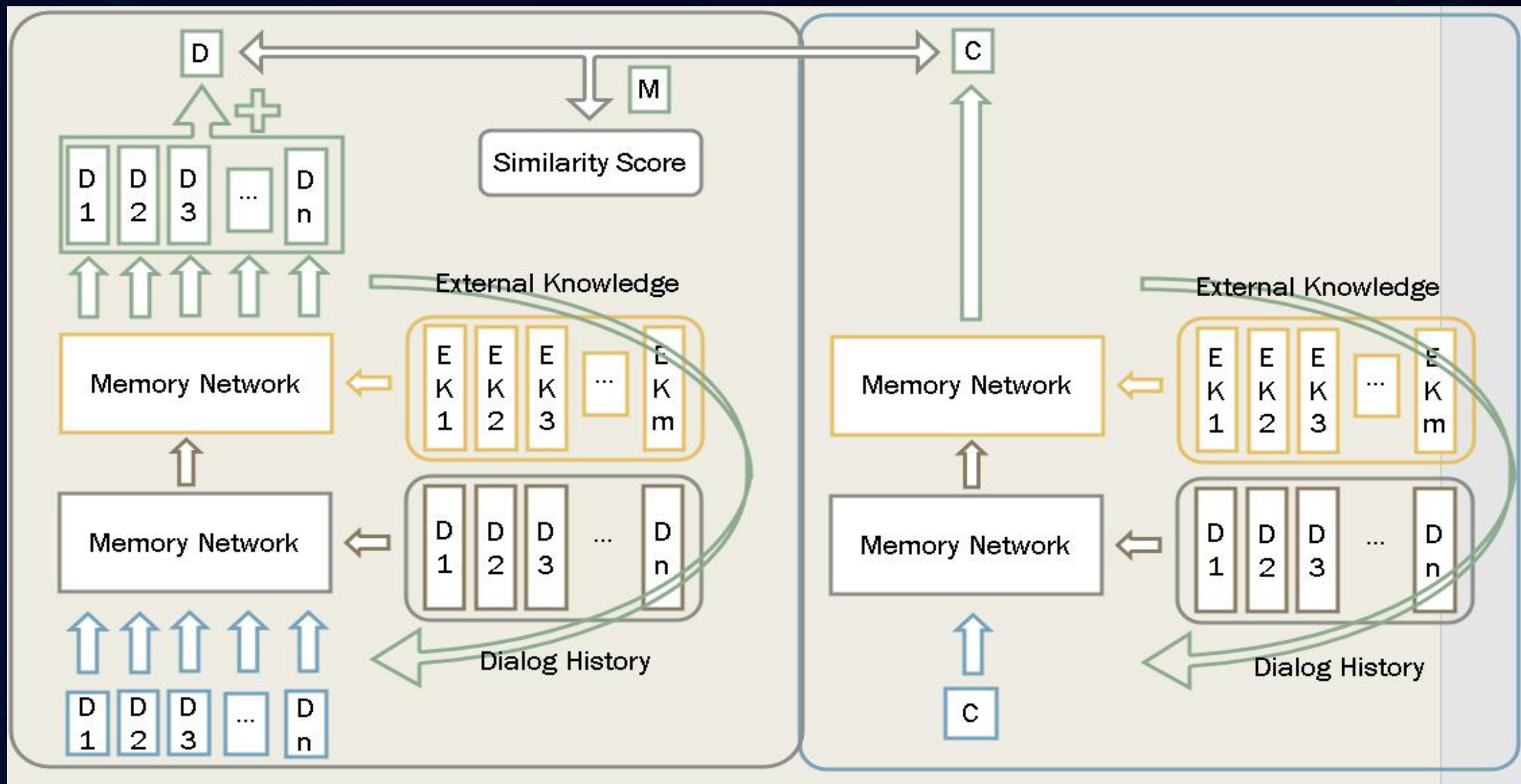
STUDENT COURSE PREFERENCES



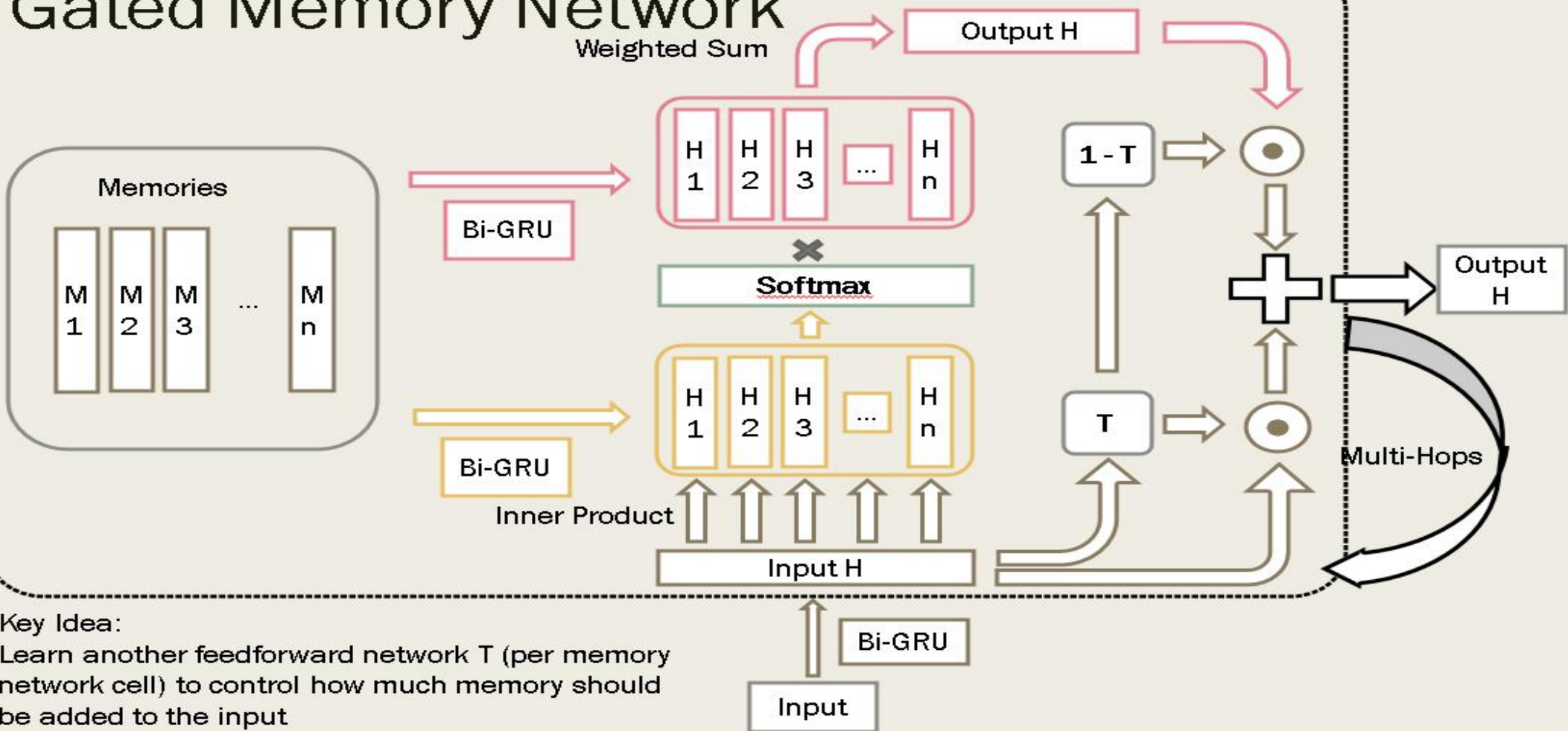
Structure of a memory network cell

- slightly different from the original paper
- using **Bidirectional GRU** instead of word embedding matrices
- using different sets of weights for every memory network hop

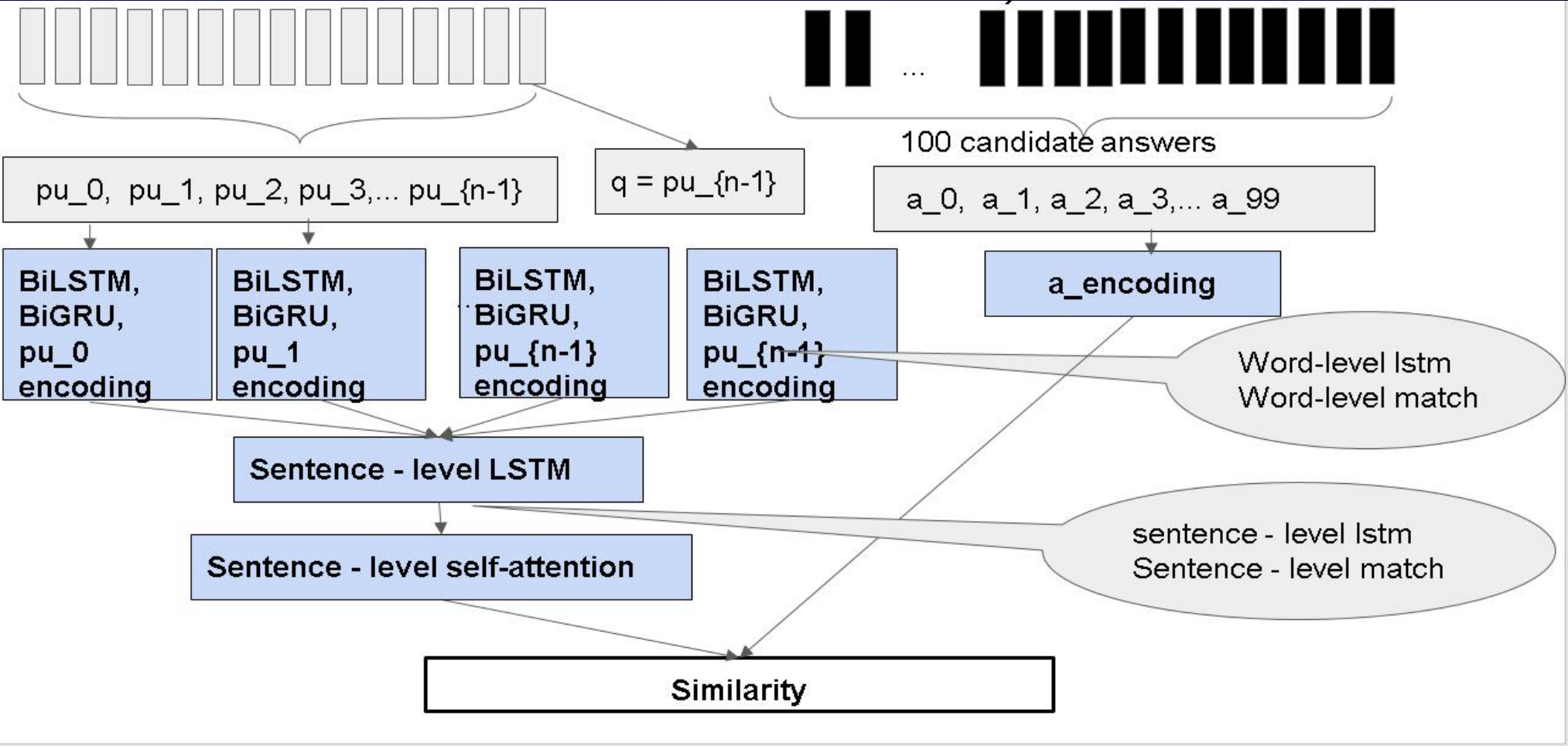




Gated Memory Network



Baseline: Hierarchical LSTM



模型benchmark

- recall@10: probability of correct answers in top 10 results

Model	Recall@10
H-LSTM without Attention	0.52
H-LSTM with Attention	0.55
Memory Network	0.65
Gated Memory Network	0.67

案例介绍

Harman
Allure

JBL Go
Smart 2

海美迪小白盒V1

长安汽车

南方航空

招行客服

案例介绍

智能耳机



外交部12308助手

外交部 12308 微信版

3 微信智能应答

以前：用户经常就常用的领事信息进行咨询，现有的自动应答功能无法满足用户的需求。

现在：依据长期积累的领事保护专业知识和经验，通过微信智能应答，向用户提供常见的领事保护与服务的应急指导和咨询，介绍领事证件有关信息。用户既通过文字输入，也可以通过语音输入。

The screenshot shows a WeChat chat interface for the 12308 service. The chat is titled "领事直通车" (Embassy Direct Line). The messages include:

- User: 您好，这是外交部12308领事保护热线吗？我地为泰国曼谷某公司商务保护... (Hello, is this the 12308 Consular Protection Hotline of the Ministry of Foreign Affairs? I am a business protection officer for a company in Bangkok, Thailand...)
- Bot: 您好，您可以通过以下方式联系我们：1. 在... (Hello, you can contact us in the following ways: 1. In...)
- User: 我在泰国旅游了怎么办？ (What should I do if I am traveling in Thailand?)
- Bot: 若您有外事护照，旅行证请按照如下... (If you have a passport or travel document, please follow the following...)

At the bottom of the chat, there are buttons for "资讯公告" (Information Announcement), "安全提醒" (Safety Reminder), and "紧急求助" (Emergency Assistance).

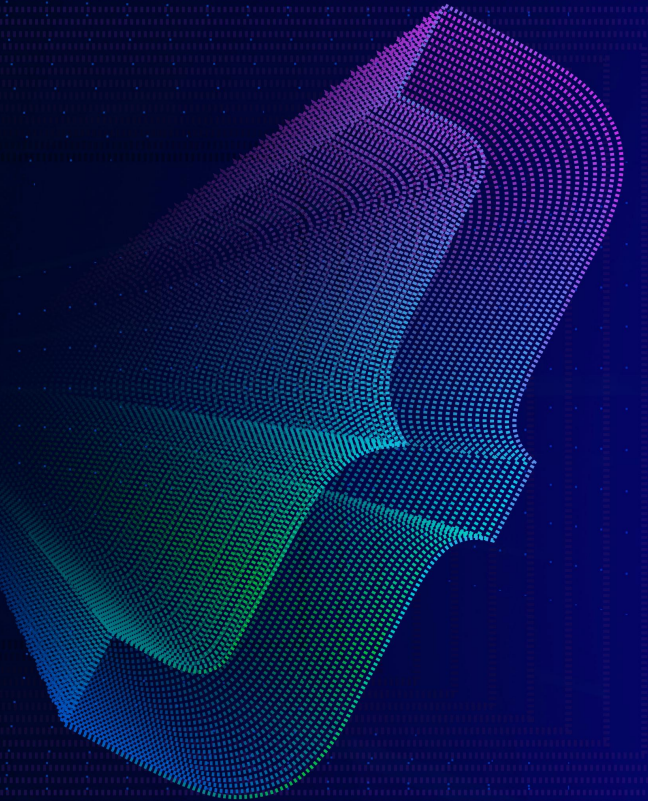
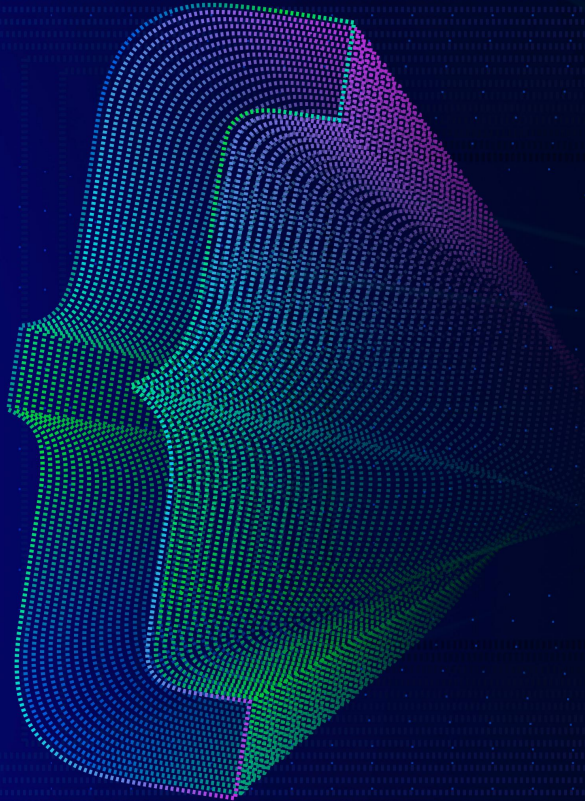
The news broadcast shows a man in a suit speaking at a podium. The text on the screen reads: "北京 王毅谈外交与新媒体 两会期间 面对新事物 外交部不会落伍" (Beijing, Wang Yi talks about diplomacy and new media. During the Two Sessions, facing new things, the Ministry of Foreign Affairs will not be out of step). Below this, another frame shows the same man with the text: "即将推出12308微信版" (The 12308 WeChat version is about to be launched). The bottom of the broadcast shows a stage with a large screen displaying the 12308 logo and the text "中华人民共和国文化和旅游部" (Ministry of Culture and Tourism of the People's Republic of China).

期待与展望

期待与展望

- **持续打通各硬件终端和软件终端**
 - 包括各种家居硬件，手机，车载；以及公众号，小程序，App
- **持续提供更加精准的对话理解的服务**
 - 即使是用户自定义场景，也会在启动阶段达到较好的理解能力
- **不断增长的内容资源**
 - 基于音乐，公众号，新闻，FM等





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