

Automatically responding to customers

February 5, 2019

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Existing benchmarks

- Braun et al.
- Snips (next slide)
- Burtsev et al.
- Botfuel

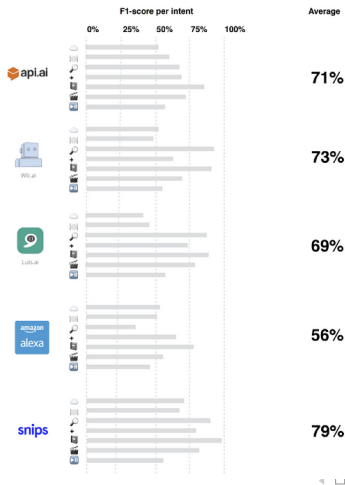
Snips entity recognition

	I need a table in Sacaton at a gluten free restaurant	✓
	I need a table in Sacaton at a gluten free restaurant	✗
	I need a table in Sacaton at a gluten free restaurant	✗
	I need a table in Sacaton at a gluten free restaurant	✗
	I need a table in Sacaton at a gluten free restaurant	✗

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Research question 1
Research question 2

Results according to Snips



Automatically responding to customers

Question and goal

- Can an open-source NLU benchmarking tool be created?
- Develop such a tool.

Improving accuracy

How hard can it be?

Question and goal

- Can accuracy for NLU be increased?
- Improve the accuracy

1 Introduction

2 Preliminaries

- Natural language processing
- Deep learning

3 Benchmarking

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Description of NLP field

- Extract meaningful information from
 - Text
 - Speech
- Generate text

Some well-known NLP tasks

- Machine translation
- Speech recognition
- Named-entity recognition
- Intent classification

Some well-known NLP tasks

- Machine translation
- Speech recognition
- **Named-entity recognition**
- Intent classification

*What is [London's](**location**) weather [tomorrow](date)?*

Some well-known NLP tasks

- Machine translation
- Speech recognition
- Named-entity recognition
- Intent classification

What is [London's](location) weather [tomorrow](date)?

get_weather

Language model

- Rule-based
- Statistical
- Try to capture grammar

Language model

- Rule-based
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Task	Example
Spell correction	$P(\textit{my car broke}) > P(\textit{my car boke})$
Machine translation	$P(\textit{green house}) > P(\textit{house green})$
Speech recognition	$P(\textit{the red car}) > P(\textit{she read ar})$

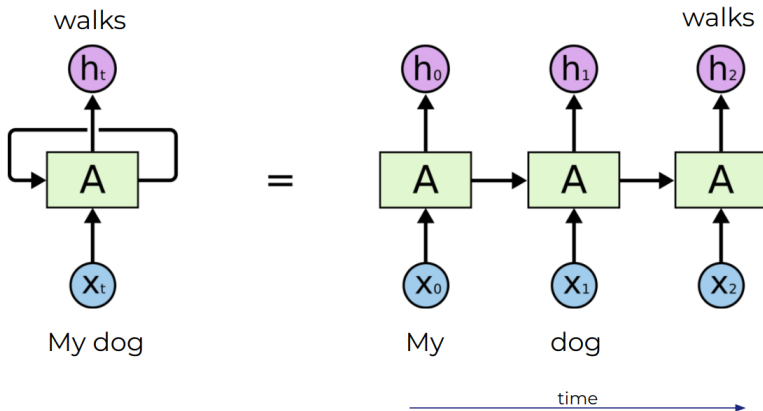


***Not tiger does that
happy look***

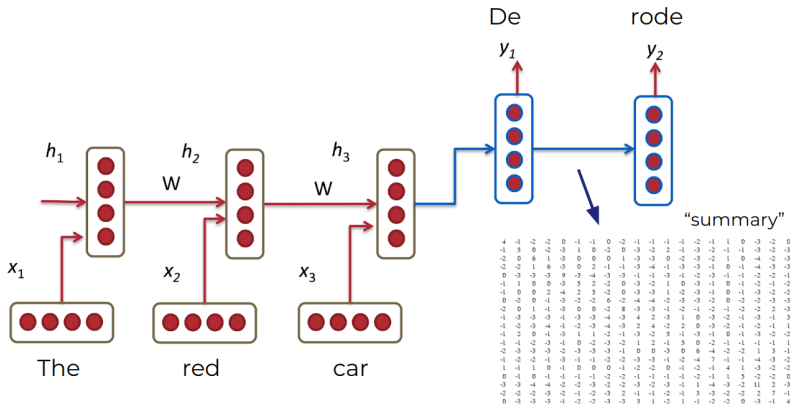
≠

***That tiger does not
look happy***

Recurrent neural networks



Translating



Insufficient history

Norwegian frigate sinking has far-reaching implications.

Het zinken van het Noorse fregat heeft verstrekkende gevolgen.

Gated recurrent neural networks

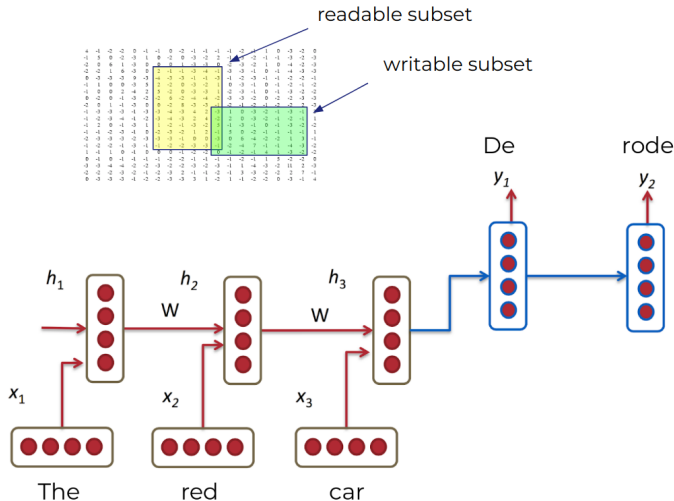


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Overview

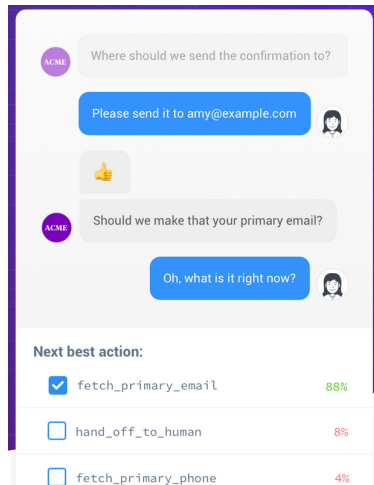
Dataset	Train	Test	Intents	Entities
WebApplications	30	54	7	1
AskUbuntu	53	109	4	3
Chatbot	100	106	2	5
Snips2017	2100	700	7	unknown

Example sentences

- WebApplications
How can I delete my [Hunch](WebService) account?
DeleteAccount
- Chatbot
*when is the [next](criterion) [train](vehicle) in
[muncher freiheit](StationStart)?*
DepartureTime
- Snips2017
*i want to listen to [Say it Again](track) by
[Blackstratblues](artist)*
PlayMusic

Rasa

- open-source
- free



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Cloud services

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Research question 1

Research question 2

Research question 1

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Research question 1

Research question 2

Research question 2
