

# Overview of the NTCIR-10 MedNLP Task

Mizuki Morita, Yoshinobu Kano, Tomoko Ohkuma

Mai Miyabe, Eiji Aramaki

<http://mednlp.jp/medist/>

## Task Settings

- **Subtasks**
  - **Task 1: De-identification Task**
    - To extract personal information
  - **Task 2: Complaint and Diagnosis Task**
    - To extract patient's medical information
  - **Task 3: Free Task**

# Task Settings

- **Timeline**

Registration open	2012-11-01
Registration close	2012-11-30
Share sample set	2012-12-10
Share test set	2013-01-25
Submission deadline	2013-02-01
NTCIR-10 conference	2013-06-18 / 21



3

# Targeted Text

- **Case history (in Japanese)**

【現病歴】1994年8月11日頃より全身倦怠感, 労作時の息切れを自覚。14日午前3時頃に黒色吐物を嘔吐したため救急車を要請し, 当院救急外来を受診。診察中に吐血したため上部消化管出血を疑い, 精査加療目的に緊急入院。

【既往歴】20代前半: 交通事故(手術なし, 輸血なし)。30歳代: 胃潰瘍(保存療法)。

- **Ungrammatical** and **fragmented** text
- Terms are diverse according to physicians

4

## Targeted Text

- **Created case history**
  - Written by physicians
  - Totally 50 histories (3,365 sentences)
- **Sample set (for development)**
  - 2,244 sentences
- **Test set (for evaluation)**
  - 1,121 sentences

5

## Tags for Annotation

- **De-identification task**

Type	Tag	Counts <sup>†</sup>
Age	<a>	56
Time	<t>	355
Hospital name	<h>	75
Location	<l>	2
Person's name	<p>	0
Sex	<x>	4

<sup>†</sup> Counts in the *sample set*.

6

# Tags for Annotation

- **Complaint and diagnosis task**

Type	Tag	Counts <sup>†</sup>
Complaint and diagnosis	<c>	1,922

- **Attributes**

Type	Attribute	Counts <sup>†</sup>
Positive		1,314
Negation	<i>modality="negation"</i>	504
Suspicion	<i>modality="suspicion"</i>	72
Family	<i>modality="family"</i>	32

7

<sup>†</sup> Counts in the *sample set*.

# Participants

- Entry: **18** groups

Domestic	Overseas
<b>15</b> groups	<b>3</b> groups (USA, Taiwan)

Academia	Industry
<b>12</b> groups	<b>6</b> groups

8

## Participants

- Submission: **12** groups

Domestic	Overseas
10 groups	2 groups (USA, Taiwan)

Academia	Industry
7 groups	5 groups

9

## Participants

- Submission: **12** groups<sup>†</sup>

Task 1 De-identification	Task 2 Complaint & diagnosis	Task 3 Free
6 groups	11 groups	1 group
15 systems	25 systems	1 system

<sup>†</sup> Up to 3 systems per group.

10

# Methods Overview

Group ID	Methods
NTTD	Word match, Semi-supervised learning
KobeU	Structured perceptron
ulab	Online learning
msiknowledge	CRF, Language Model
UT-FX	CRF
HCRL	CRF, Word match
niph	Word match
oka1	CRF, Word match
NECLA	CRF
cks01	CRF
SinicaNLP	Word match, Machine translation

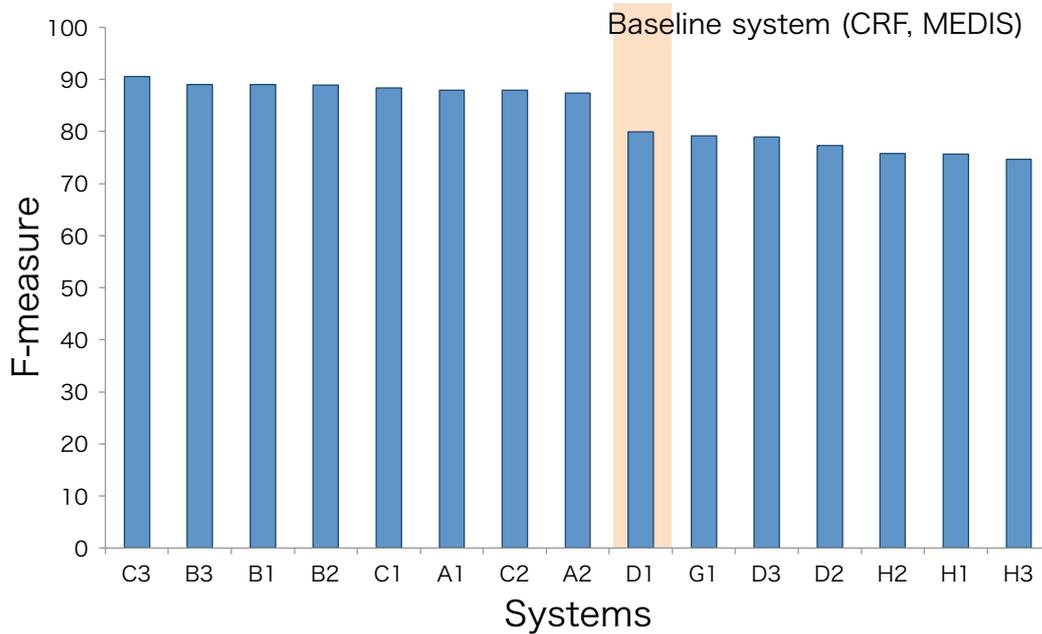
11

# Methods Overview

Group ID	Resources
NTTD	MEDIS Standard Masters (disease names)
KobeU	
ulab	Japanese newspaper (disease names)
msiknowledge	
UT-FX	MedDRA/J, MEDIS Standard Masters, Original corpus
HCRL	Japanese Wikipedia (disease names)
niph	Original dictionary
oka1	
NECLA	UMLS, LSD
cks01	MEDIS Standard Masters (disease names)
SinicaNLP	Original dictionaries (in Chinese)

12

## De-identification Task



13

## De-identification Task

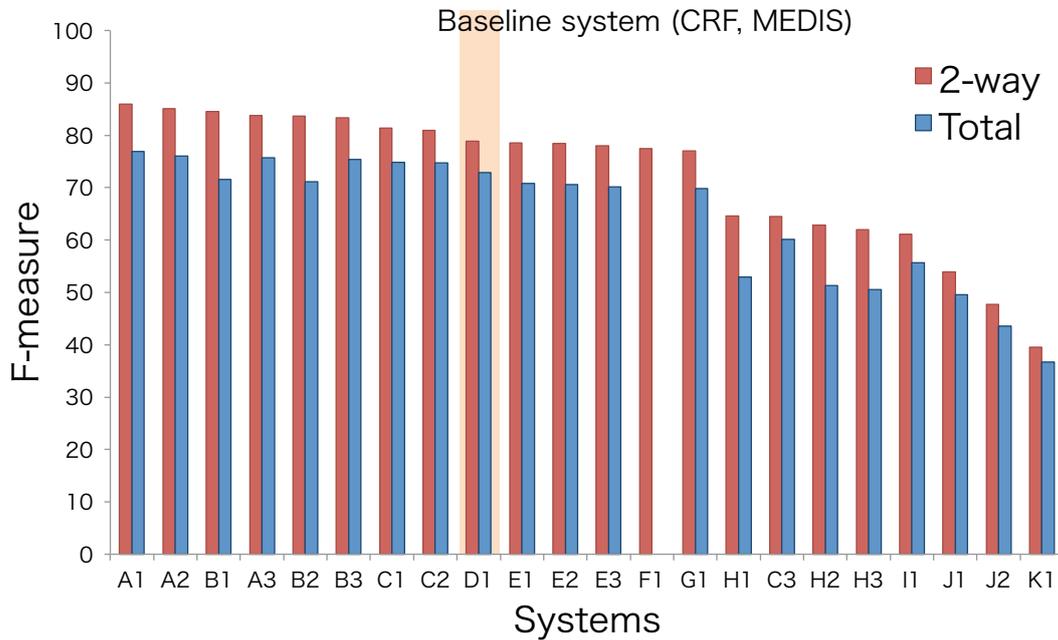
- Performances for each tag

Type	Tag	Counts <sup>†</sup>	Best (F)	Average (F)
Age	<a>	56	93.6	85.6
Time	<t>	355	90.3	84.0
Hospital name	<h>	75	96.0	82.4
Location	<l>	2	100.0	6.66
Person's name	<p>	0	-	-
Sex	<x>	4	100.0	80.0

<sup>†</sup> Counts in the *sample set*.

14

# Complaint & Diagnosis Task



15

# Complaint & Diagnosis Task

- Performances for each attribute

Attribute	Counts <sup>†</sup>	Best (F)	Average (F)
	1,314	79.3	65.5
<i>negation</i>	504	77.8	64.8
<i>suspicion</i>	72	50.7	33.6
<i>family</i>	32	81.1	64.1

<sup>†</sup> Counts in the *sample set*.

16

## Comments

- Top 3 groups are identical in both Task 1 and 2.
  - All 3 groups are from industry
- All these groups used CRF and disease name dictionaries in Task 2.
  - But the best group in Task 1 used word matching-based method.

17

## Future Directions

### **1. Stepwise development**

- To create practical tools

### **2. Create community**

- To communicate each other

### **3. Publish products**

- Tools, resources, and papers

18

# Future Directions



19

# Future Directions

- **IR meets Medicine**
  - MedRITE (Recognizing Inference in Text)
  - MedMT (Machine Translation)
  - MedQA (Question Answering)
  - MedTS (Text Summarization)

20

# Breakout Session

18:00-20:00 @ Room 2001 A, B (20F)

- For casual discussion on MedNLP
- With Pizza and Coke (or Tea)
  - 1,000 JPY / person
- Let us know if you are interested
  - We will order Pizza later



21

<http://www.heartbeetcafe.com/wp-content/uploads/2013/04/pizza3.jpg>

## Acknowledgements

- **Participants**
- **Physicians**
- **NTCIR Project Office**
  - Noriko Kando
  - Tetsuya Sakai
  - Kazuko Matsuo
  - Mariko Okada
  - Others
- **Annotators & Others**
  - Hiroto Imachi
  - Sachiko Maskawa
  - Ayako Yamashita
  - Junko Hiranuma

22