ArabicNLU 2024:

The 1st Arabic Natural Language Understanding Shared Task


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Open Source

Arabic NLP Tools and Datasets

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https://sina.birzeit.edu/resources

SinaLab

Resources

Download and demo our tools and datasests

- + Arabic Ontology — الأنطولوجيا العربية
- + Lexicographic Databases (Qabas) — حوسبة المعاجم (قبس و150 معجم)
- + Dialect Corpora (Currasat) — مدونة اللهجات العامية (كراسات)
- + SinaTools — أدوات سينا
- + Morphology Tagger (Alma) — المحلل الصرفي (ألمى)
- + Word Sense Disambiguation (Salma) — المحلل الدلالي (سلمى)
- + Named Entity Recognition (Wojood) — استخراج أسماء الاعلام (وجود)
- + Relation Extraction — استخراج العلاقات
- + Social Computing (Fada) — الإنسانيات الحاسوبية والتواصل الاجتماعي (فضا)
- + Synonyms — استخراج المترادفات
- + Chatbots and intent detection (AraBanking77) — المساعدات الآلية

Motivation

- **Natural Language Understanding is a fundamental** aspect of NLP.
- Enable **semantic-based** human-computer interactions.
- A major **challenge in Arabic** due to its morphological richness.

ArbicNLU2024 Shared Task

Subtask 1 Word Sense Disambiguation

Best: 78%

Baseline: 84%

SALMA Corpus

34k sense-annotated tokens

Subtask 2 Location Mention Disambiguation

Best: 95%

Baseline: 62.7%

IDRISI-DA Corpus

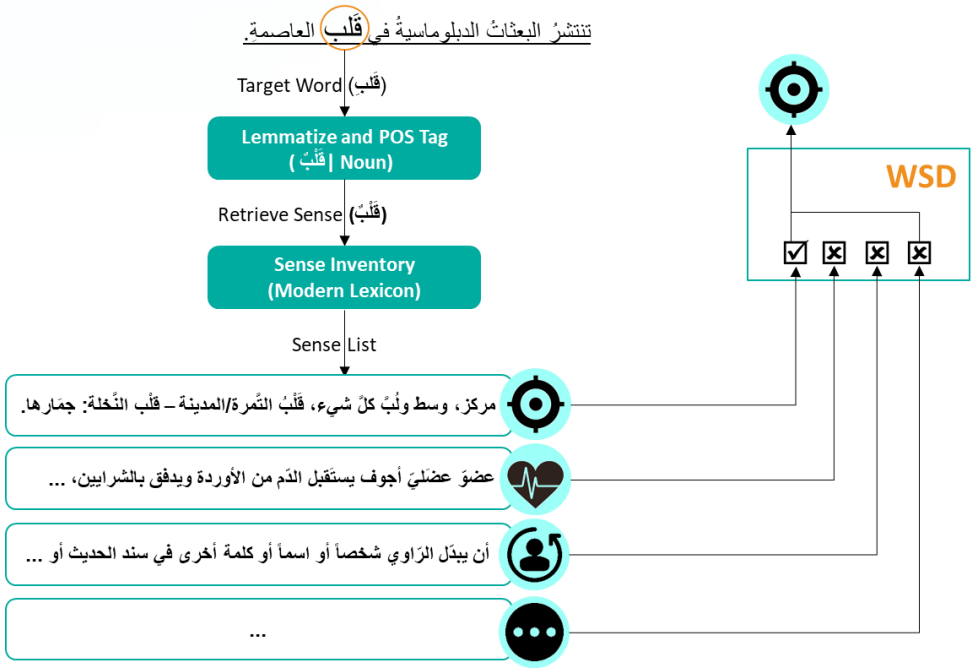
3900 annotations

Natural Language Understanding

- **Subtask-1 Word Sense Disambiguation (WSD):** to disambiguate the semantics of polysemous words.
- **Subtask-2 Location Mention Disambiguation (LMD):** to resolve location mentions and linking them to toponyms in geo-databases.

Task Description

Subtask1 : Word Sense Disambiguation (WSD):



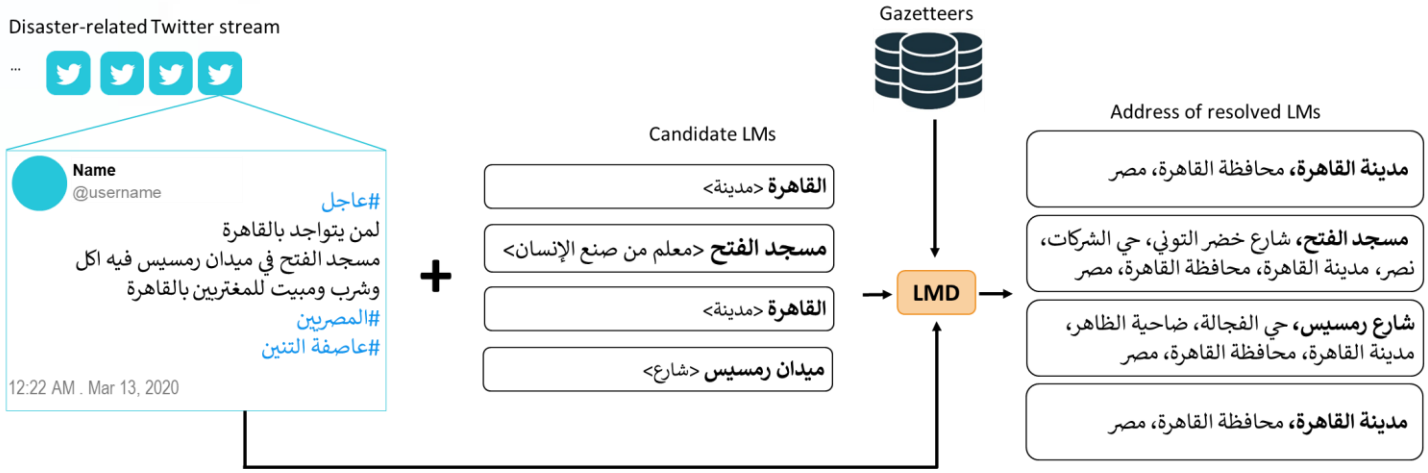
WSD Dataset (SALMA)

First sense-annotated corpus for Arabic:

- 1,440 sentences.
- 34K tokens 8,760 unique tokens with 3,875 unique lemmas).
- A total of 4,151 senses.

Task Description

Subtask2 : Location Mention Disambiguation (LMD):

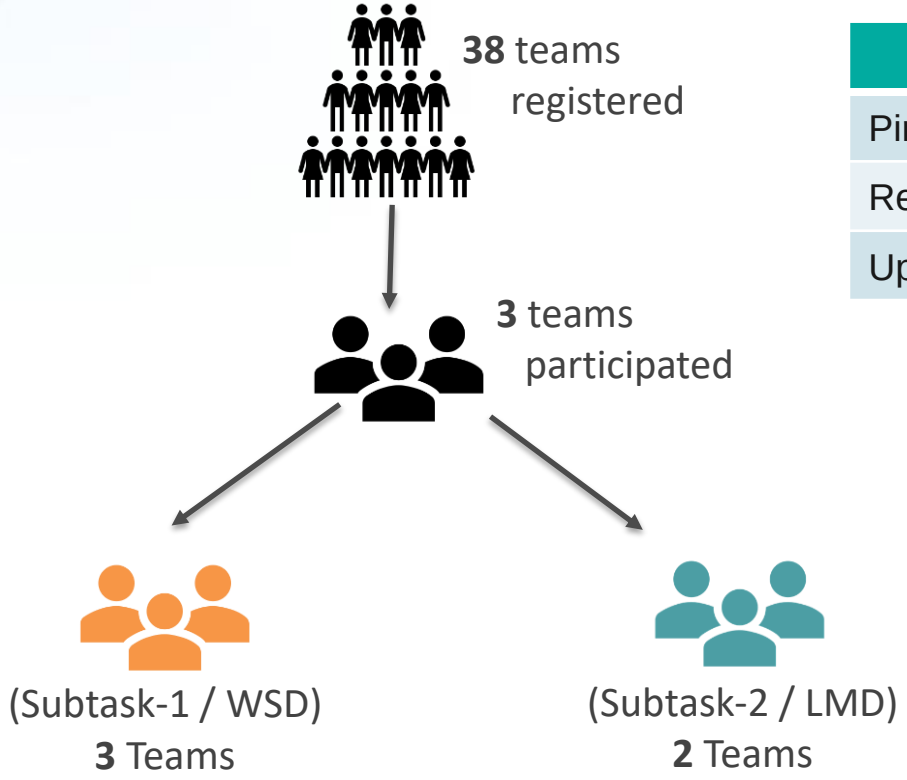


LMD Dataset (IDRISI)

First Arabic LMD dataset. It contains:

- 2,869 posts from diverse dialects.
- 3,893 location mentions, of which 763 are unique, across seven countries.

Shared Task Teams & Results



Team	Affiliation	Task
Pirates	Nile University	1
Rematchka	Cairo University	1, 2
Upaya	SCB DataX	1, 2

Participating Systems

Subtask-1 WSD (baseline 84.2%):

- **Top team** (77.8%) used Llama3-70B-Instruct for zero-shot learning, outperforming GPT-4.
- **2nd team** (77.8%) fine-tuned AraBERTv2 as a sense classifier.
- **3rd team** (57.5%) employed zero-shot learning using LLMs and finetuning PLMs.

Subtask-2 Location Mention Disambiguation (LMD) (baseline 57.24%): **:**

- **Top team** (94.97%) used Llama3 for translation and GeoPy for toponym retrieval.
- **2nd team (**59.94%) used Open Street Map for retrieval and Cohere for reranking.

Shared Task Teams & Results

Results of Subtask 1 – WSD

Rank	Team	Accuracy
	Baseline	**84.2%**
1	Upaya	77.8%
2	Pirates	70.8%
3	Rematchka	57.5%

Results of Subtask 2 – LMD

Rank	Team	MRR@1	MRR@2	MRR@3
1	Rematchka	94.97%	95.00%	95.00%
2	Upaya	59.94%	59.94%	59.94%
	Baseline	**57.24%**	**63.96%**	**64.28%**

Open Challenges

- **WSD and LMD are challenging tasks!!** Need for more datasets and more research.
- **Arabic dialectics** should be supported in WSD and LMD.
- **LLMs performed badly** - compared to classification architectures.
- Maybe **Arabic-tailored LLMs are needed**!!.

Thank You

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