Multi Language Support for Virtual Assistants

Arabic/Spanish case study

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Motivation

- People expect to be able to talk to their VA the way they talk to a friend (conversational)
- 422 million native Arabic speakers
- 483 million native Spanish speakers
- VAs will be how people interact with the web and find information (right now non English speakers are at a severe disadvantage)

أعطني معلومات
عن الانتخابات

State of the Art - Translated VA

- In previous works, data collection is mainly done using human annotators and translators to verify quality

- Instead, we use automated translation for our task, which works because semantic parsing is more robust to translation noise

Problems

- Almond currently works for Farsi, Italian and Chinese in the hotels & restaurants domains
- Extending Almond in other languages to other domains
- Data collection for languages without translated structured data (Yelp is in 15 languages)
- Automate Google translate corrections
- Generate colloquial sentences in other languages

State of the Art - Arabic conversational

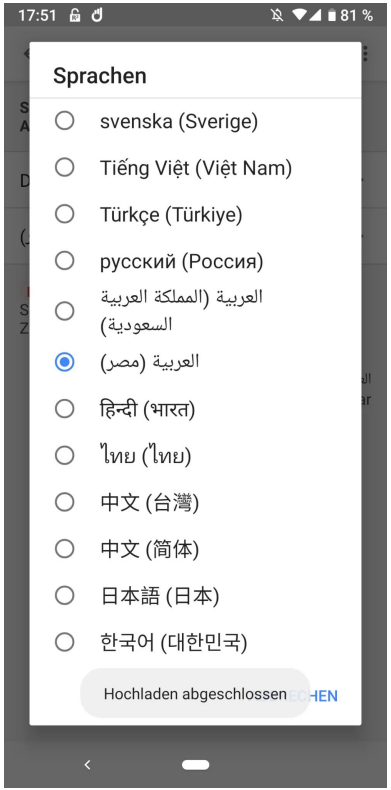
Google has Saudi and Egyptian Arabic and is adding new Arabic dialects as of Dec. 2019

Siri only supports Modern Standard Arabic and not dialect

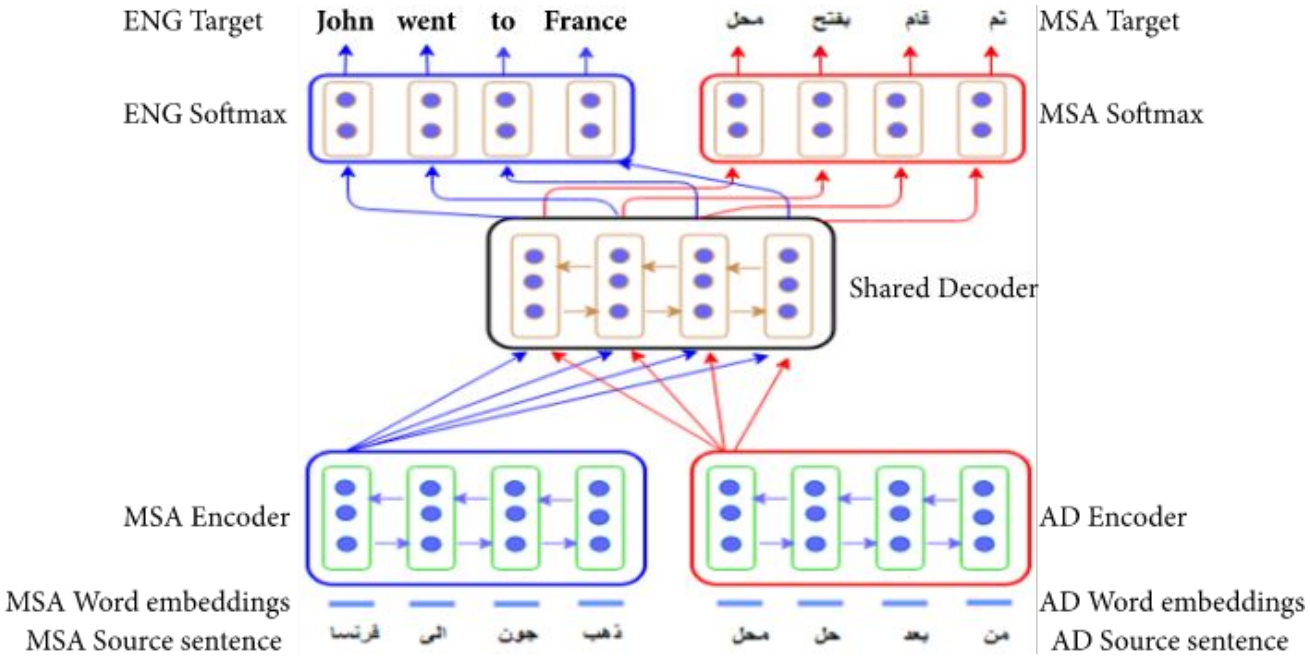
[Research ML agent to translate dialects to MSA]

[Arabic and AI: Why voice-activated tech struggles in the Middle East]

- Arabic dialect includes many portmanteaus (words created by combining other words) and often exclude separate prepositions
- Arabic dialects haven't been written down until recently



State of the Art - Arabic conversational



Plan - Colloquial Arabic

- Generate colloquial sentences in Levantine Arabic
  - **Translate Levantine sentences into Modern Standard Arabic using neural network**
- Incorporate corpuses of named entities in Arabic into model
- Test with native Arabic speaker to get qualitative data

Plan

- Reproduce existing results
- Extending Almond in other languages to other domains - **Arabic & Spanish**
- Data collection for languages without translated structured data - **test new data collection strategies**
- Explore Genie training methods
- Add the mBART framework for translation correction
- Implement translation of colloquial Arabic

What We Expect to Learn

- How easy is it to build a generalizable system that people can add to to improve results for specific languages/dialects across domains
- Compare different data collection strategies/platforms (Wikipedia, social media, etc.) versus structured data
- Compare autoencoder training strategies for Arabic dialects
    - Do our strategies generalize to cross-language translation?
- Evaluate mBART's capabilities for correcting low-quality Google Translate results

Demo

- Setting up a restaurant/ hotel reservation in Spanish and Arabic
- Showing a short colloquial Arabic transaction
- Graphs comparing how well each ML method perform at correcting translations

Detailed Plan

	Sierra	Max
Week 5	Reproduce existing results	Reproduce existing results
Week 6	Baseline for Arabic/ Spanish for restaurant domain, baseline on hotels domain	Dataset/ parameter collection for Arabic and Spanish
Week 7	Build model to translate between dialects and MSA, baseline results	Automating sentence-correction for Arabic and Spanish
Week 8 (paper deadline)	Improve results from 7, try adding named entities corpus in Arabic	Expanding current work to other domains
Week 9	Discussion on future work	Discussion on future work
Week 10	Wrap up the project and celebrate!	Wrap up the project and celebrate!