Boosting Zero-shot Cross-lingual Retrieval by Training on Artificially Code-Switched Data

CIS

nlp

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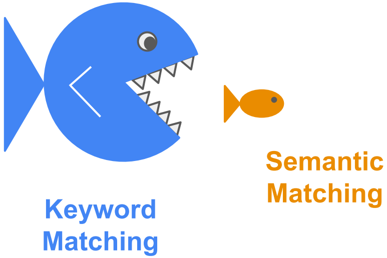
61 ACL 2023

Challenge: Monolingual Overfitting

Training

what is a death roll in crocodiles

The death roll performs a number of functions for the Saltwater Crocodile. When it grabs very large prey the crocodile has to drag it into the water and drown it so the crocodile [...] to roll over and over again to drown it's prey.



We use the mMARCO dataset (Bonifacio et al., 2021). See also Litschko et al. (2022) on monolingual overfitting.

Challenge: Monolingual Overfitting

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Monolingual IR	Symptome von Fieber (symptoms of fever)	Die Liste der Anzeichen und Symptome, die in verschiedenen Quellen für Fieber erwähnt werden, umfasst die 8 unten aufgeführten Symptome: Schwitzen. Temperatur. Strenge. Brechreiz. Erbrechen. Durchfall. Lethargie.	✓

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Cross-lingual IR	симптомы лихорадки (symptoms of fever)	Die Liste der Anzeichen und Symptome, die in verschiedenen Quellen für Fieber erwähnt werden, umfasst die 8 unten aufgeführten Symptome: Schwitzen. Temperatur. Strenge. Brechreiz. Erbrechen. Durchfall. Lethargie.	✗

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Method: Artificial Code-Switching

Zero-Shot Transfer

🇺🇸

Query: what is a death roll in crocodiles

Passage: the death roll performs a number of functions for the Saltwater...

Translate Train (Fine-tuning)

💸

Query: что такое список крокодилов

Passage: Die Todesrolle erfüllt für das Salzwasserkrokodil eine Reihe von Funktionen...

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Bilingual Code-Switching (CS)*

Cross-lingual Word Embedding Space (Lample et al., 2018)

🇷🇺

🔻

🇺🇸

Query: что is a death roll in крокодилы

Passage: The death roll выполняет a число of функции for в Saltwater...

*Code-Switching similar to Tan and Joty (2021).

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Multilingual Code-Switching (CS)*

Multilingual Word Embedding Space (Lample et al., 2018)

Query: cosa is a موت rollen in крокодилы

Passage: Der death rotolo performs a число of المهام for в Saltwater...

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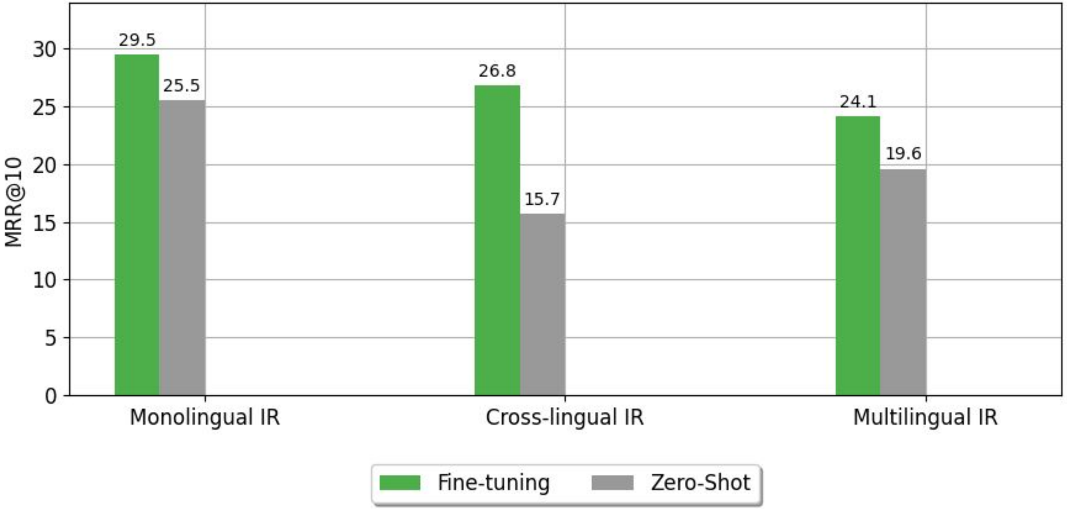
Code-Switching is **Effective**



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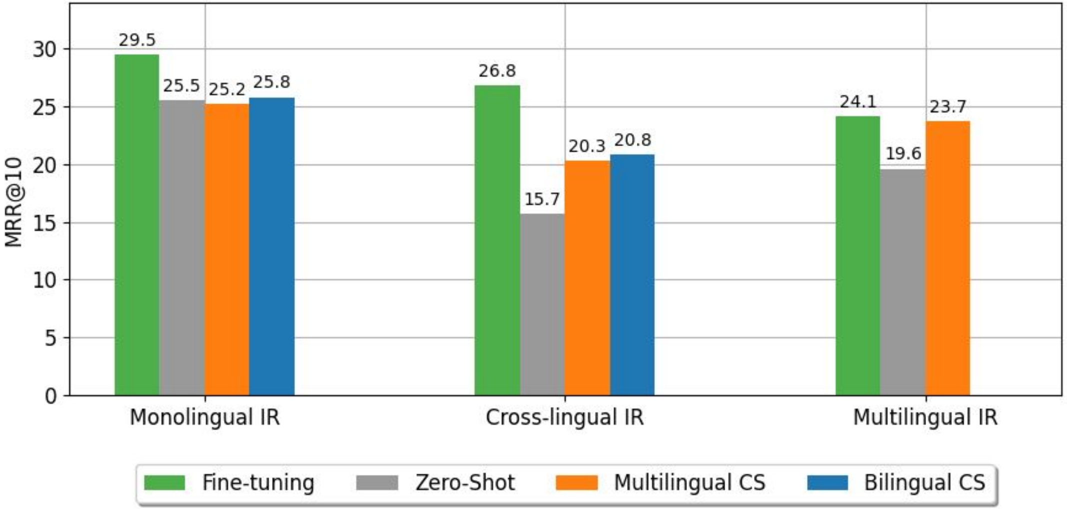
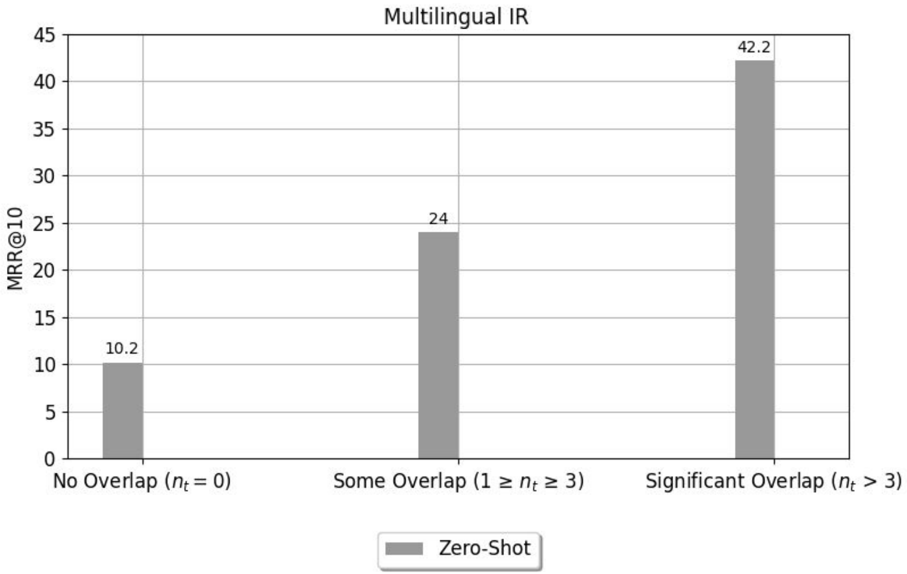
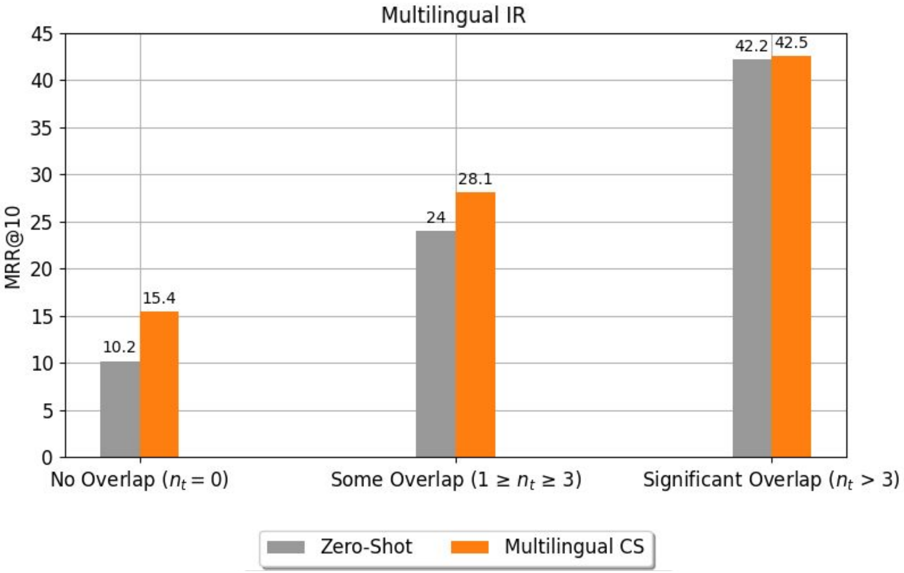


CS mitigates **Monolingual Overfitting**



CS mitigates **Monolingual Overfitting**



More Results in our Paper

Robustness w.r.t. Translation Probability

Code-Switching with Parallel Wikipedia Titles

Eight Unseen Languages

- ID
- FR
- PT
- HI
- VT
- ZH
- ES
- JA

twitter.com/MaiNLPlab

github.com/MaiNLP/CodeSwitchCLIR

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