Final assignment: Cross-encoder re-rankers

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1 INTRODUCTION

2 TASK 1: EVALUATING CROSS-ENCODERS

Table 1. Effectiveness results of three fine-tuned cross-encoder models

Model	nDCG@10	Recall@100	MAP@1000	#Training Steps
MiniLM	**0.696**	**0.507**	0.450	47569 / 156250
TinyBERT	0.691	0.506	**0.458**	76301 / 156250
distilroberta	0.611	0.463	0.392	9036 / 156250

3 TASK 2: SELECT AND APPLY FIVE ENSEMBLE METHODS

Table 2. Effectiveness results of five ensemble methods

Model	nDCG@10	Recall@100	MAP@1000
Mixed	0.707	0.513	0.465
Reciprocal Rank Fusion (RRF)	0.699	0.507	0.462
BayesFuse	0.697	0.507	0.451
PosFuse	**0.710**	**0.516**	**0.480**
Weighted BordaFuse	0.707	0.511	0.464

4 TASK 3: ANALYZING MOST EFFECTIVE ENSEMBLE METHOD

Table 3. Effectiveness results of all combinations

Combination	nDCG@10	Recall@100	MAP@1000
MiniLM + TinyBERT	**0.723**	**0.518**	**0.483**
MiniLM + distilroberta	0.691	0.509	0.463
TinyBERT + distilroberta	0.694	0.507	0.468

5 TASK 4: MODIFYING THE EVALUATION METRIC IN FINETUNING

6 TASK 5: ENSEMBLING THROUGH SCORE INJECTION

REFERENCES

IR'23, Master CS, Spring 2023, Leiden, the Netherlands