# Appendix

**Table 3.** Pairwise comparisons of systems and the number on how many of the 16 datasets the system in the row outperformed the system in the column.

| | BL | Elasticsearch | FaissHNSW | Hnswlib | LuceneKNN | N2 | NGT-PANNG | NGT-QG | NN-Descent | OpenSearch-kNN | pg-embedding | PyNNDescent | QSGNGT | Vald | Vespa | Voyager | Weaviate | FLANN | MRPT | Scann | FaissIVF | FaissIVFPQ | TinyKNN | #Better |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BL | | 16 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 8 | 6 | 0 | 0 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 44 |
| Elasticsearch | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FaissHNSW | 0 | 16 | | 0 | 5 | 4 | 0 | 0 | 0 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 3 | 0 | 1 | 0 | 8 | 55 |
| Hnswlib | 4 | 16 | 6 | | 14 | 5 | 2 | 0 | 4 | 9 | 5 | 6 | 0 | 11 | 9 | 7 | 11 | 7 | 6 | 4 | 1 | 0 | 11 | 138 |
| LuceneKNN | 0 | 16 | 0 | 0 | | 0 | 0 | 0 | 0 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 27 |
| N2 | 0 | 8 | 3 | 0 | 8 | | 0 | 0 | 0 | 8 | 0 | 0 | 1 | 4 | 6 | 5 | 6 | 0 | 0 | 0 | 1 | 0 | 5 | 55 |
| NGT-PANNG | 0 | 16 | 0 | 0 | 4 | 3 | | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 3 | 0 | 1 | 0 | 13 | 53 |
| NGT-QG | 0 | 16 | 4 | 0 | 13 | 6 | 3 | | 2 | 13 | 5 | 5 | 0 | 8 | 9 | 10 | 12 | 5 | 7 | 2 | 1 | 0 | 14 | 135 |
| NN-Descent | 0 | 16 | 0 | 0 | 12 | 1 | 0 | 0 | | 15 | 8 | 2 | 0 | 0 | 0 | 0 | 9 | 5 | 6 | 0 | 1 | 0 | 16 | 91 |
| OpenSearch k-NN | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| pg-embedding | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| PyNNDescent | 0 | 16 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 9 | 0 | | 0 | 0 | 0 | 0 | 5 | 2 | 1 | 0 | 1 | 0 | 14 | 56 |
| QSGNGT | 0 | 16 | 1 | 0 | 11 | 5 | 1 | 0 | 0 | 9 | 4 | 3 | | 5 | 3 | 3 | 9 | 5 | 6 | 1 | 1 | 0 | 13 | 96 |
| Vald | 0 | 16 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 10 | 35 |
| Vespa | 0 | 16 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 9 | 6 | 0 | 0 | 0 | | 0 | 10 | 2 | 2 | 0 | 1 | 0 | 11 | 71 |
| Voyager | 0 | 16 | 0 | 0 | 13 | 1 | 0 | 0 | 0 | 10 | 8 | 0 | 0 | 0 | 0 | | 10 | 3 | 2 | 0 | 0 | 0 | 11 | 74 |
| Weaviate | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | 28 |
| FLANN | 3 | 12 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 6 | 3 | 0 | 0 | 2 | 0 | 0 | 4 | | 0 | 0 | 0 | 0 | 9 | 44 |
| MRPT | 0 | 13 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 4 | 0 | 0 | 6 | 0 | | 0 | 0 | 0 | 10 | 48 |
| Scann | 0 | 15 | 1 | 0 | 1 | 3 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 1 | 1 | 0 | 5 | 6 | | 1 | 0 | 8 | 51 |
| FaissIVF | 10 | 12 | 7 | 7 | 11 | 4 | 8 | 8 | 9 | 12 | 4 | 8 | 6 | 9 | 8 | 8 | 10 | 8 | 9 | 7 | | 0 | 11 | **176** |
| FaissIVFPQ | 1 | 15 | 8 | 5 | 8 | 14 | 6 | 7 | 2 | 8 | 0 | 4 | 6 | 9 | 7 | 8 | 8 | 5 | 8 | 5 | 2 | | 14 | 150 |
| TinyKNN | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 11 |
| #Worse | 18 | 315 | 31 | 12 | 136 | 47 | 22 | 15 | 17 | 156 | 62 | 28 | 13 | 59 | 43 | 42 | 117 | 53 | 60 | 19 | 12 | **0** | 185 | |

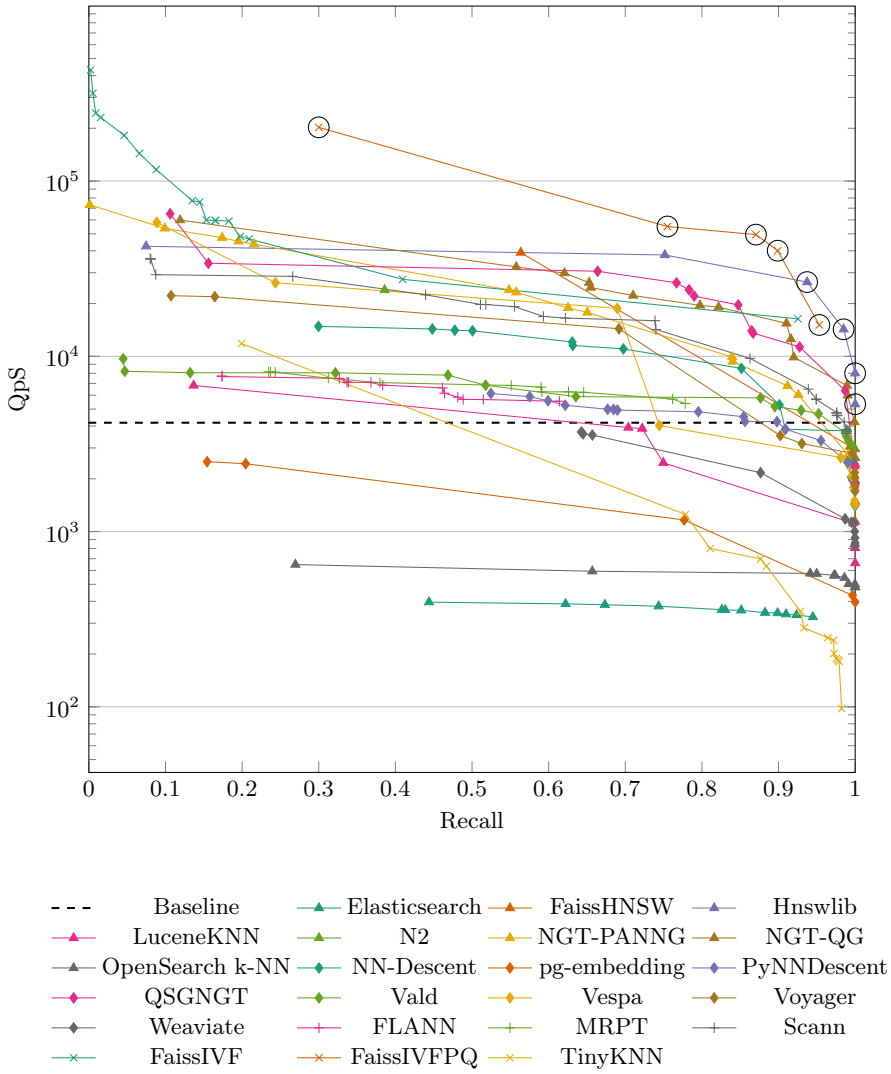


**Fig. 5.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 DistMult embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

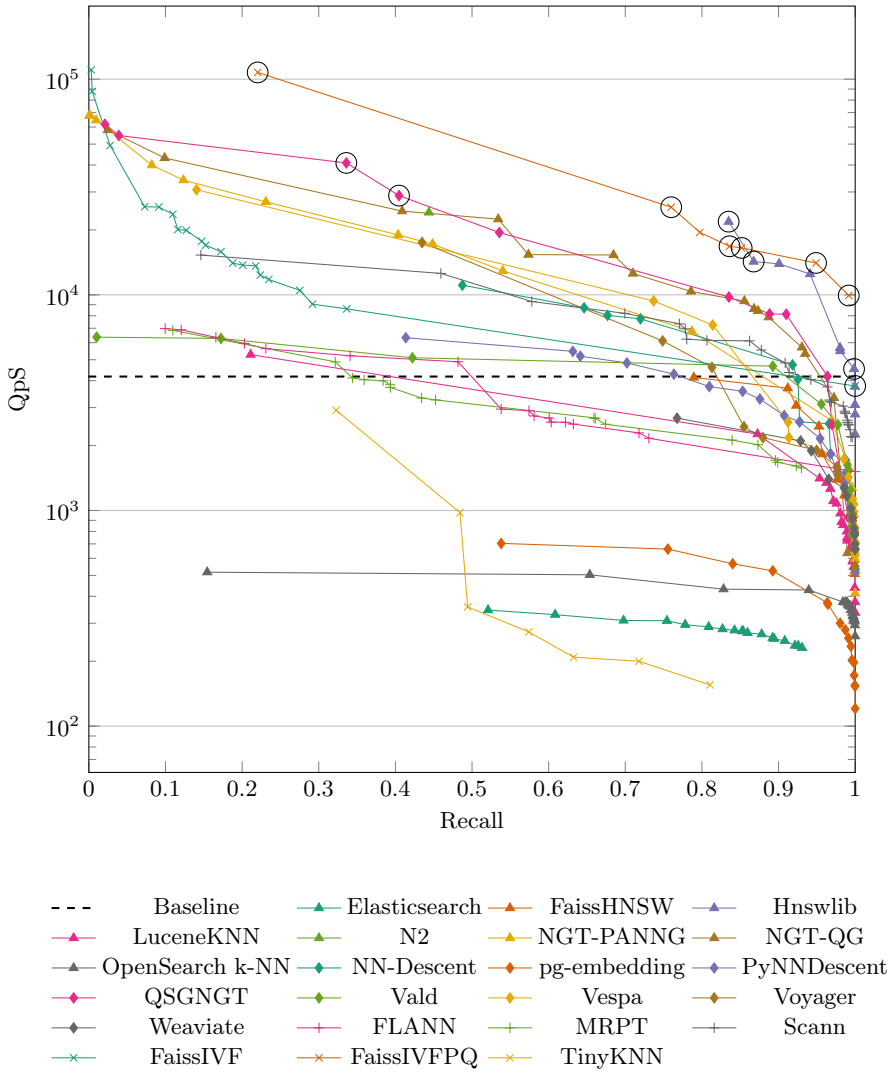


**Fig. 6.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 QuatE embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

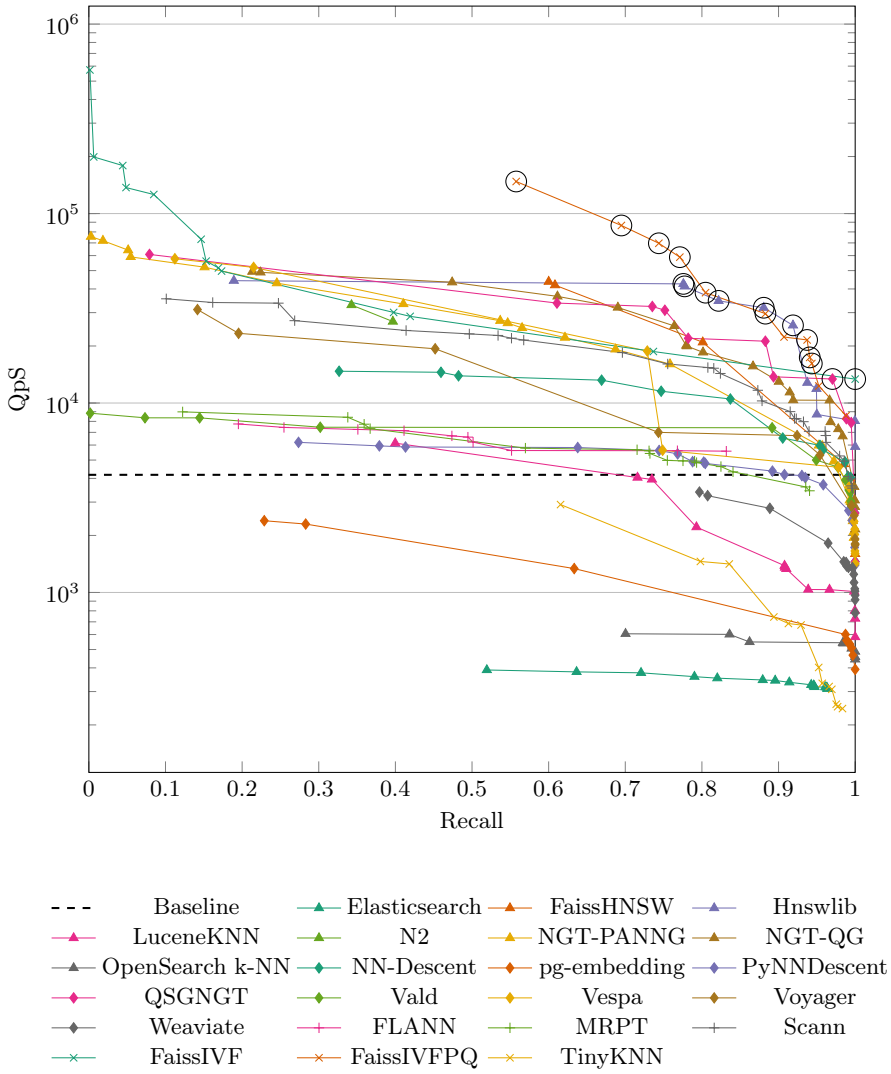


**Fig. 7.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 OMult embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

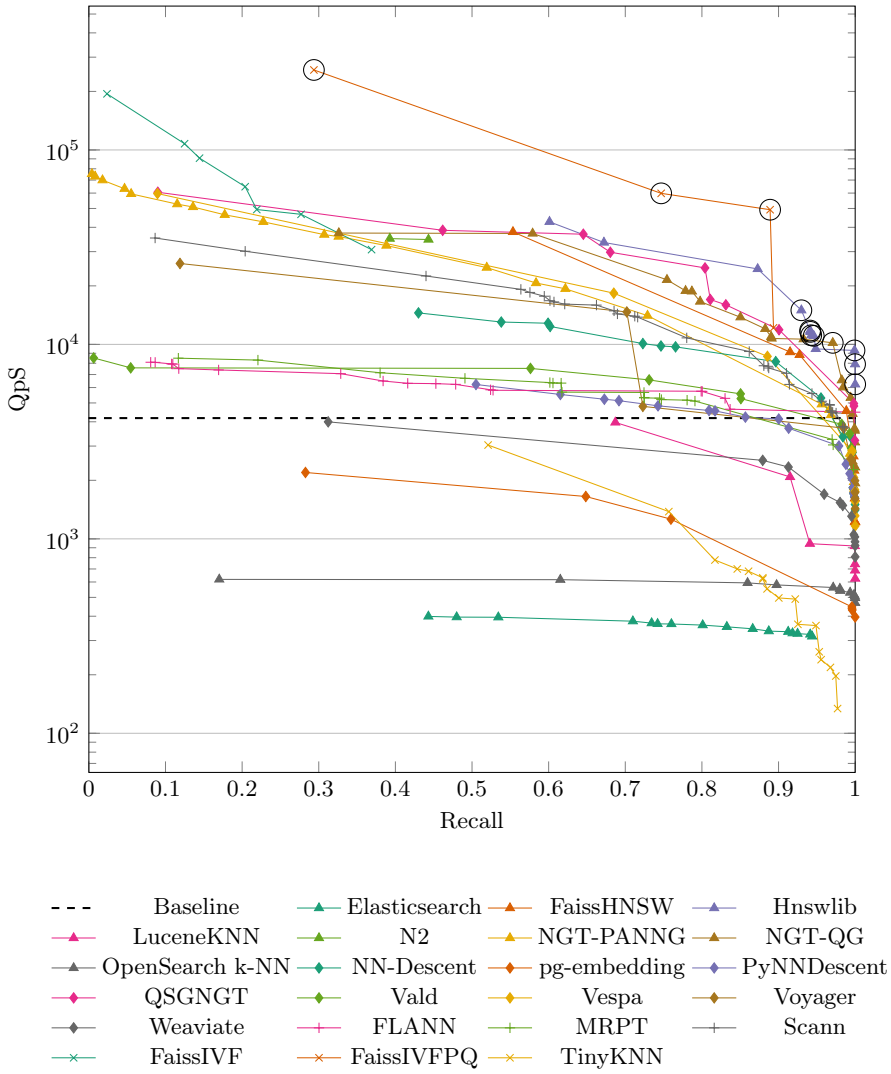


**Fig. 8.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 Keci embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

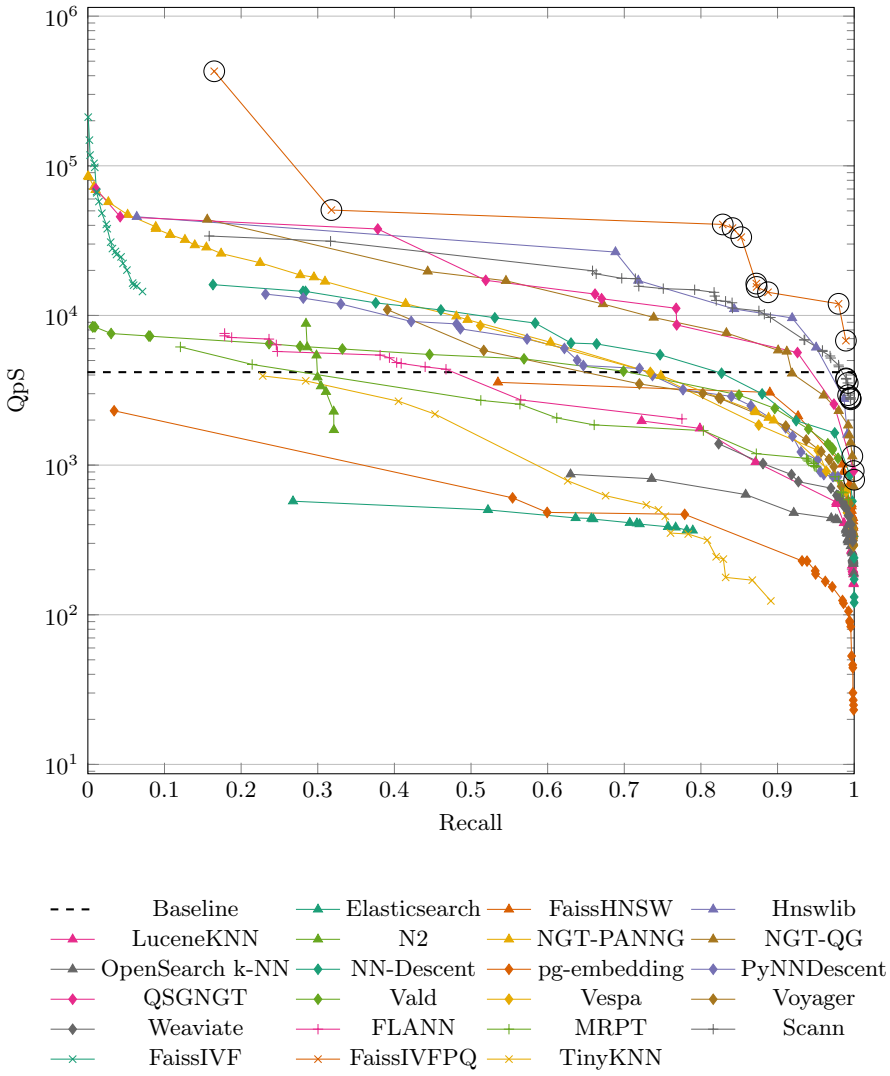


**Fig. 9.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 DistMult embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

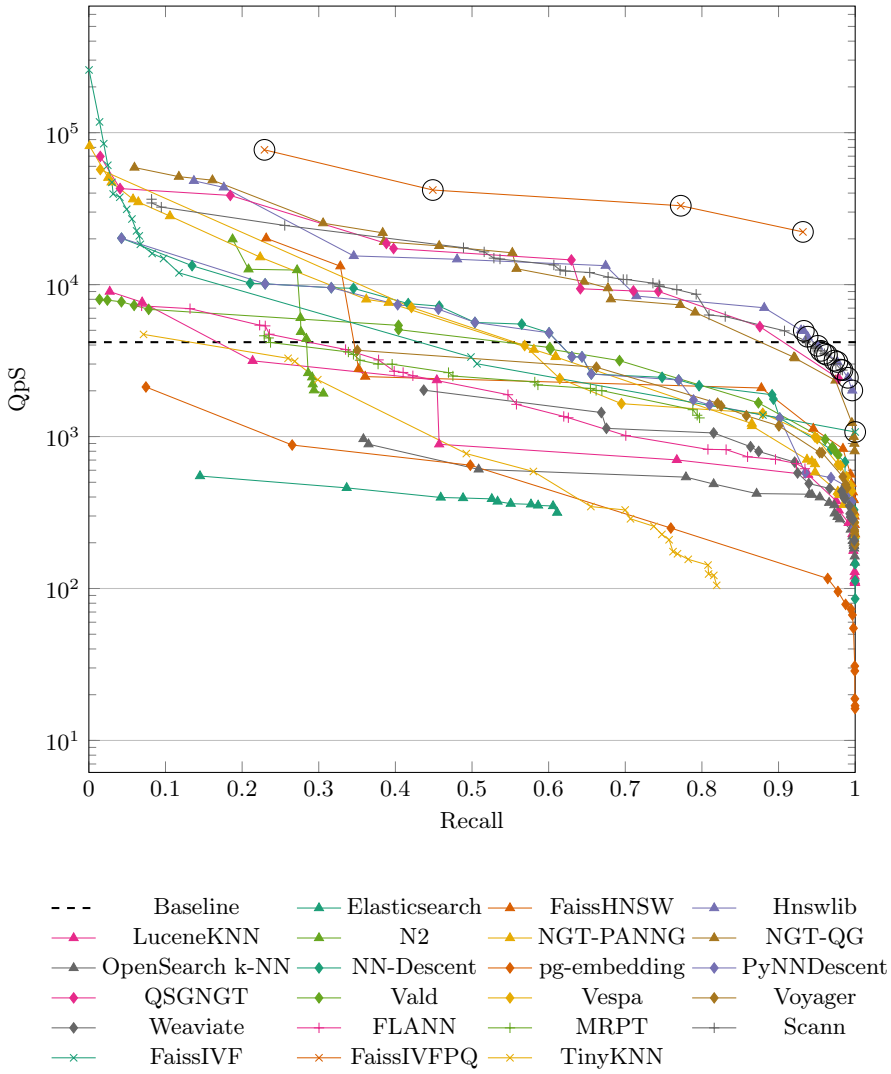


**Fig. 10.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 QuatE embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

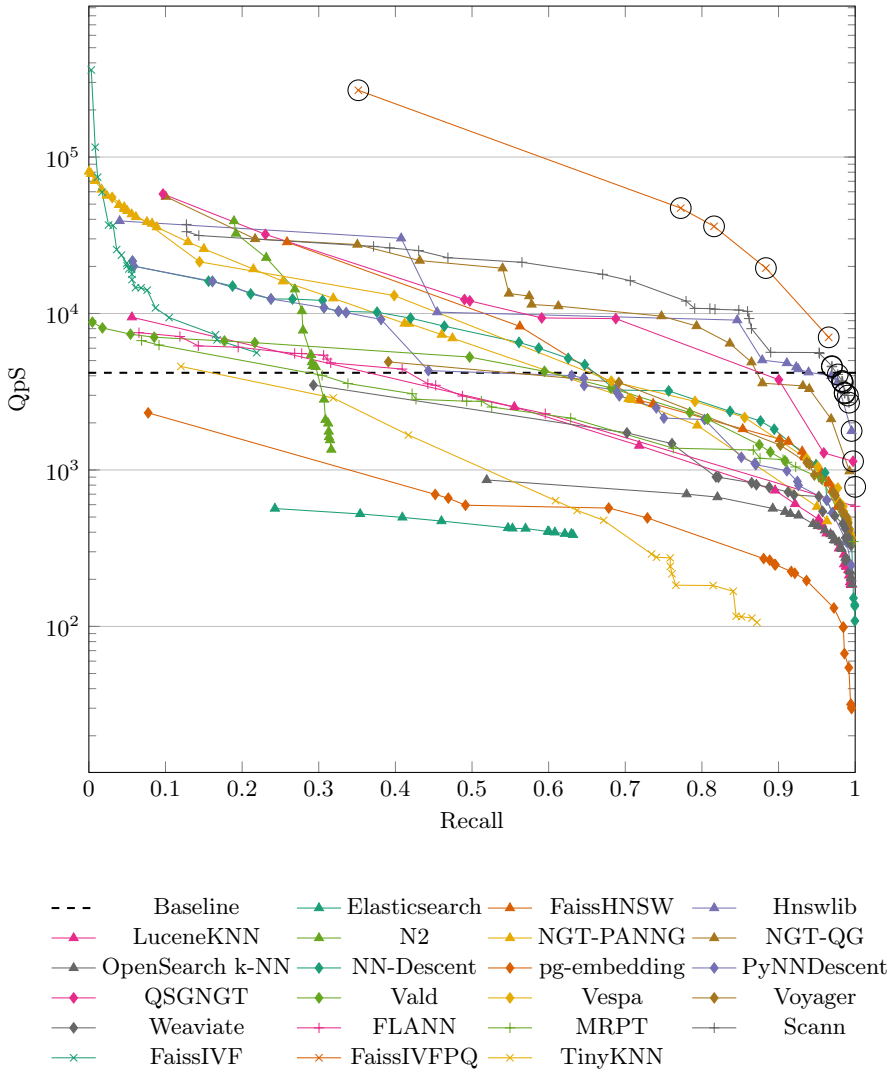


**Fig. 11.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 OMult embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

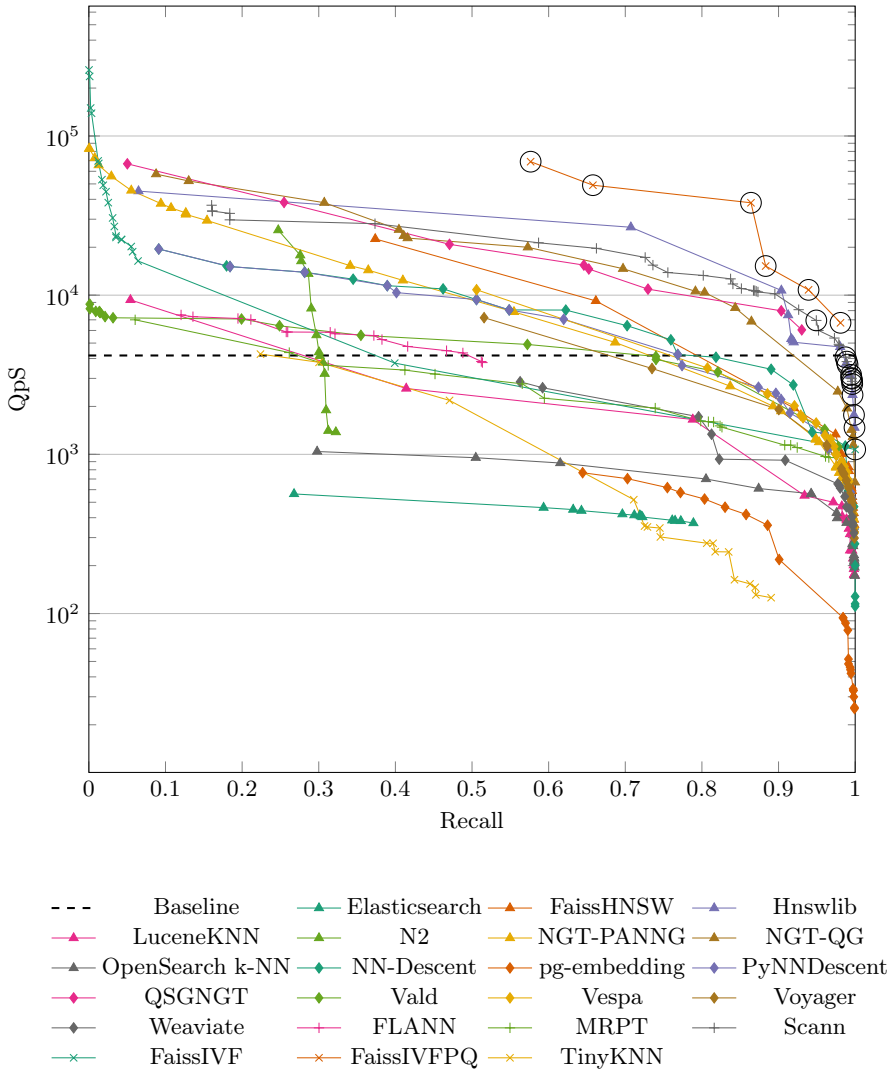


**Fig. 12.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 Keci embeddings with angular distance. The best configurations for this dataset have been encircled (◯).

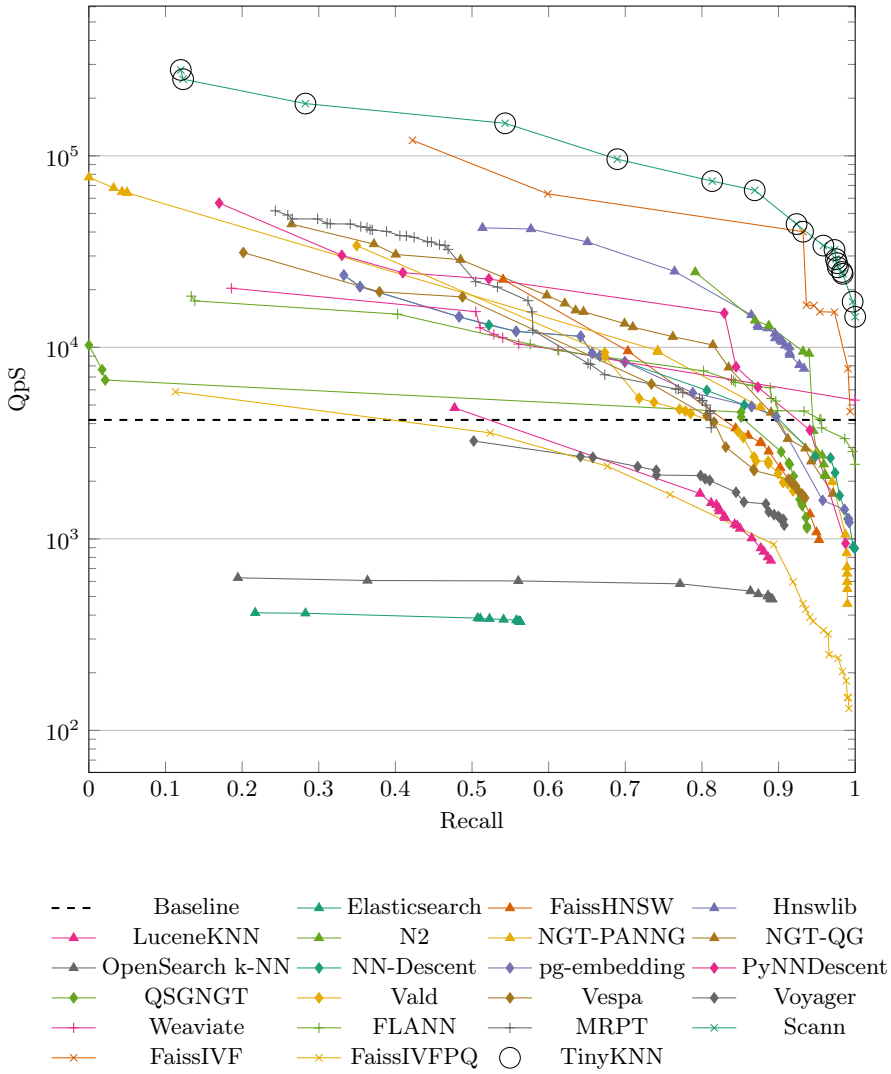


**Fig. 13.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 DistMult embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

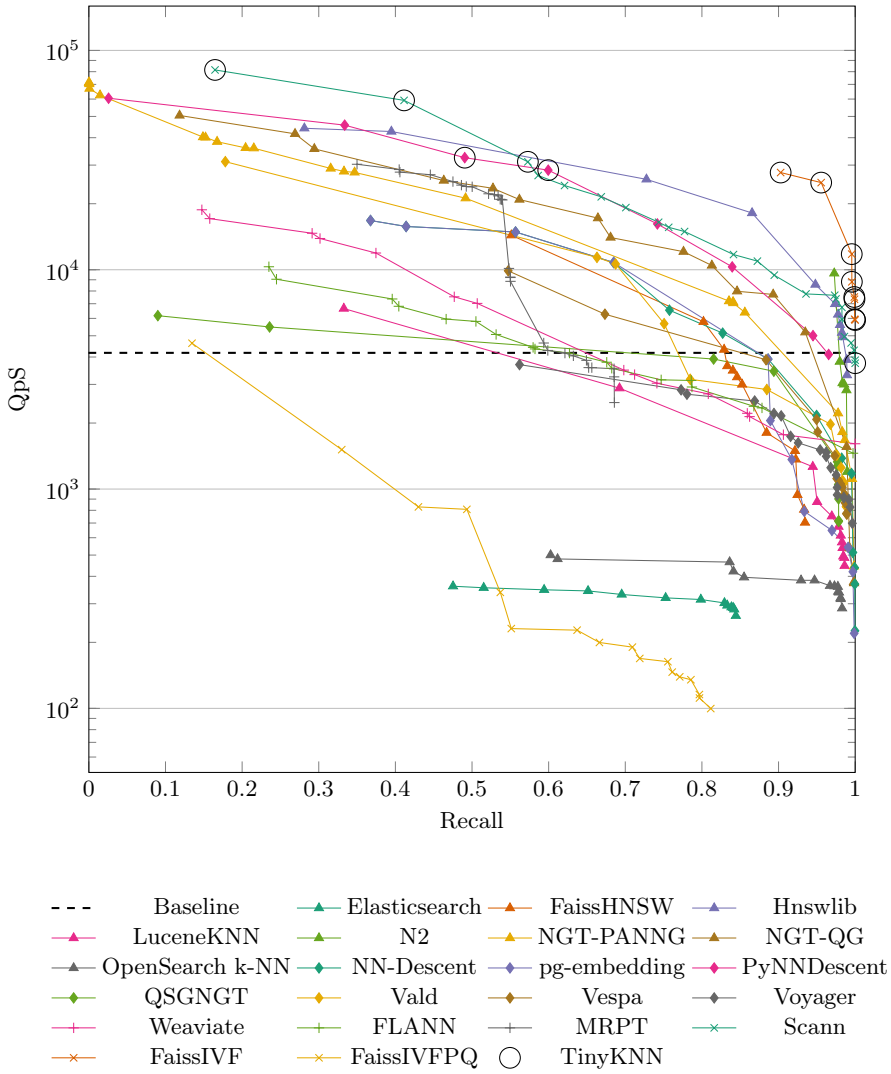


**Fig. 14.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 QuatE embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

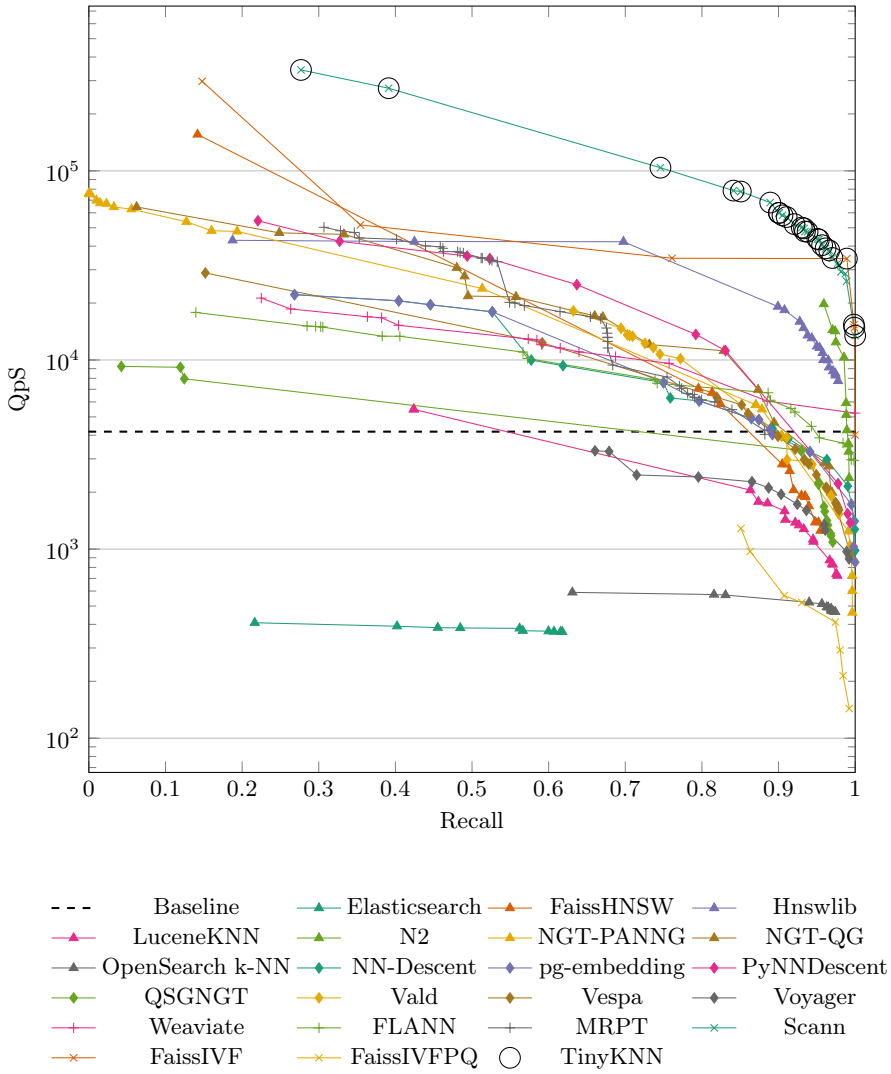


**Fig. 15.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 OMult embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

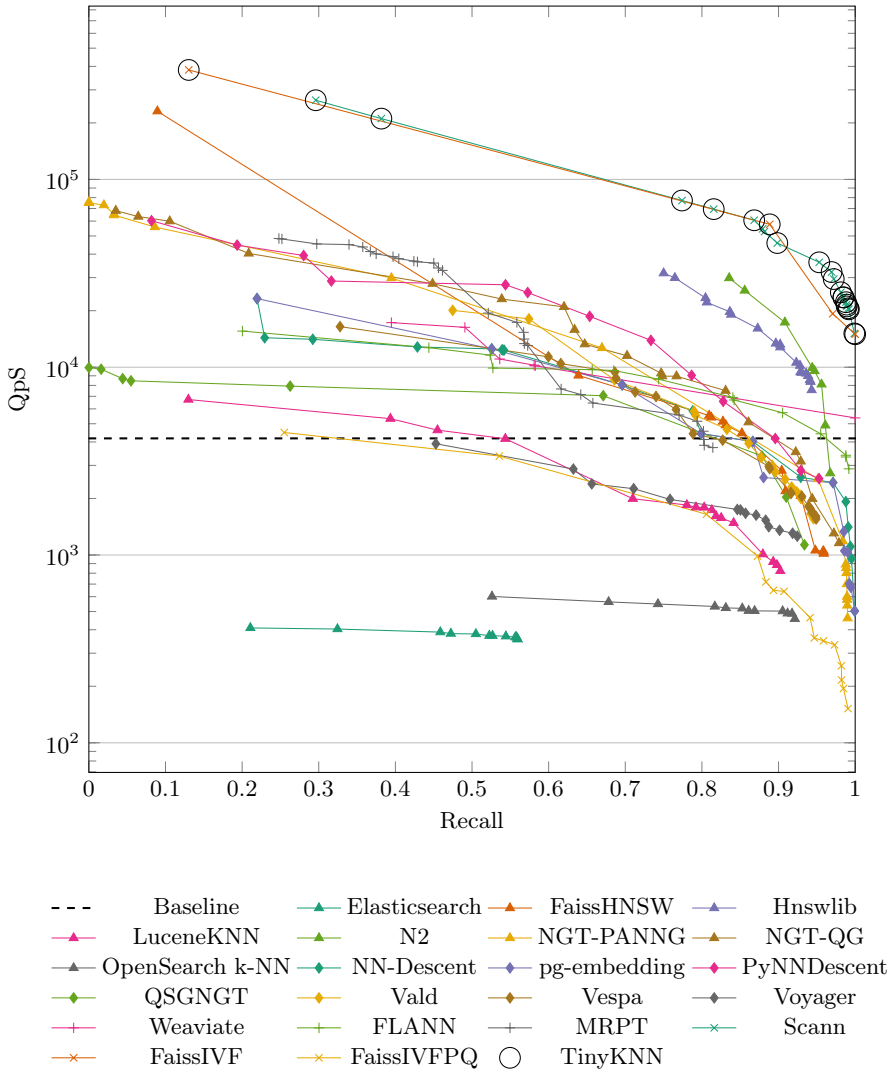


**Fig. 16.** The best configurations for all tested systems and the performance of the baseline on the FB15k-237 Keci embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

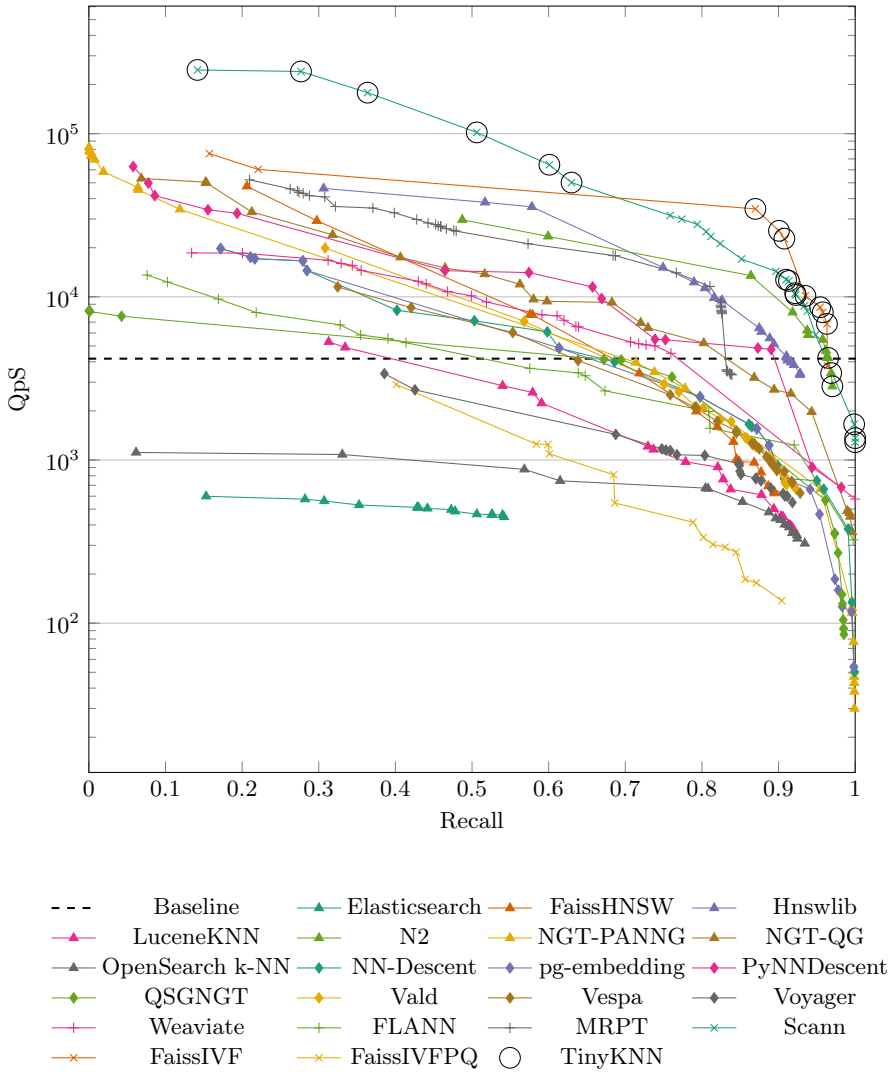


**Fig. 17.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 DistMult embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

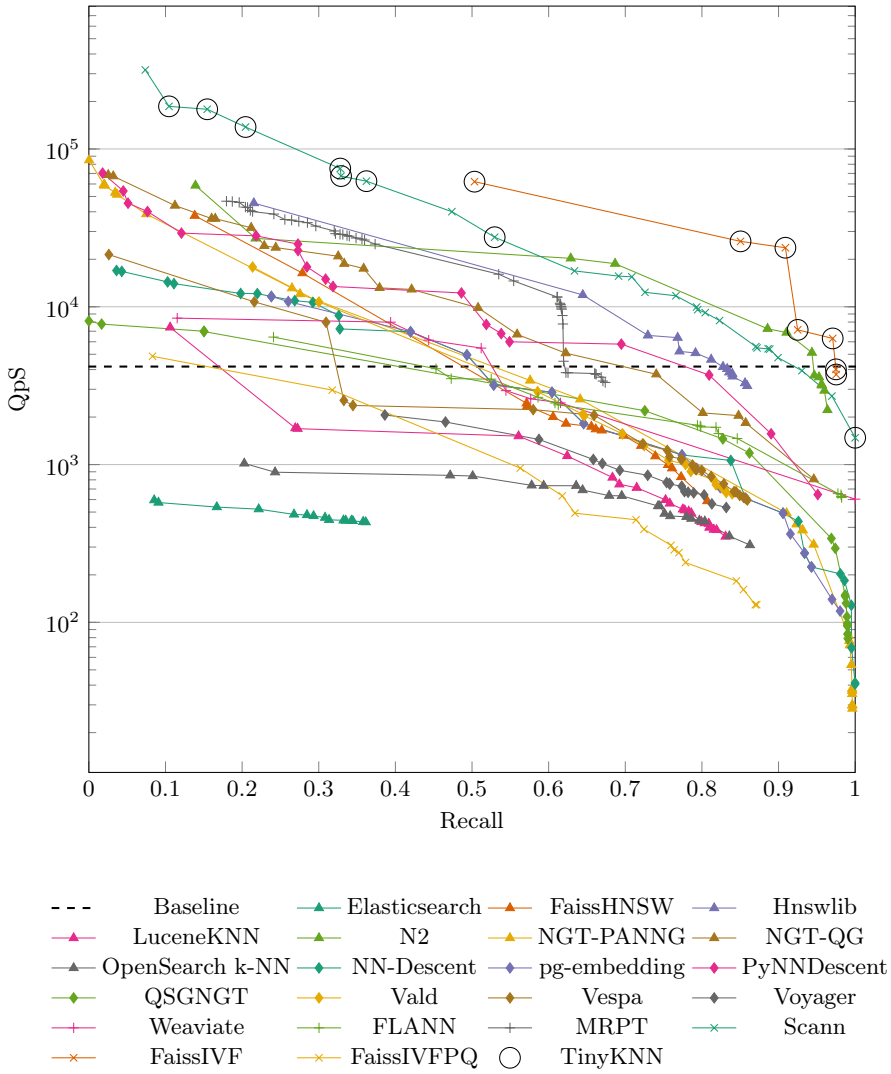


**Fig. 18.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 QuatE embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

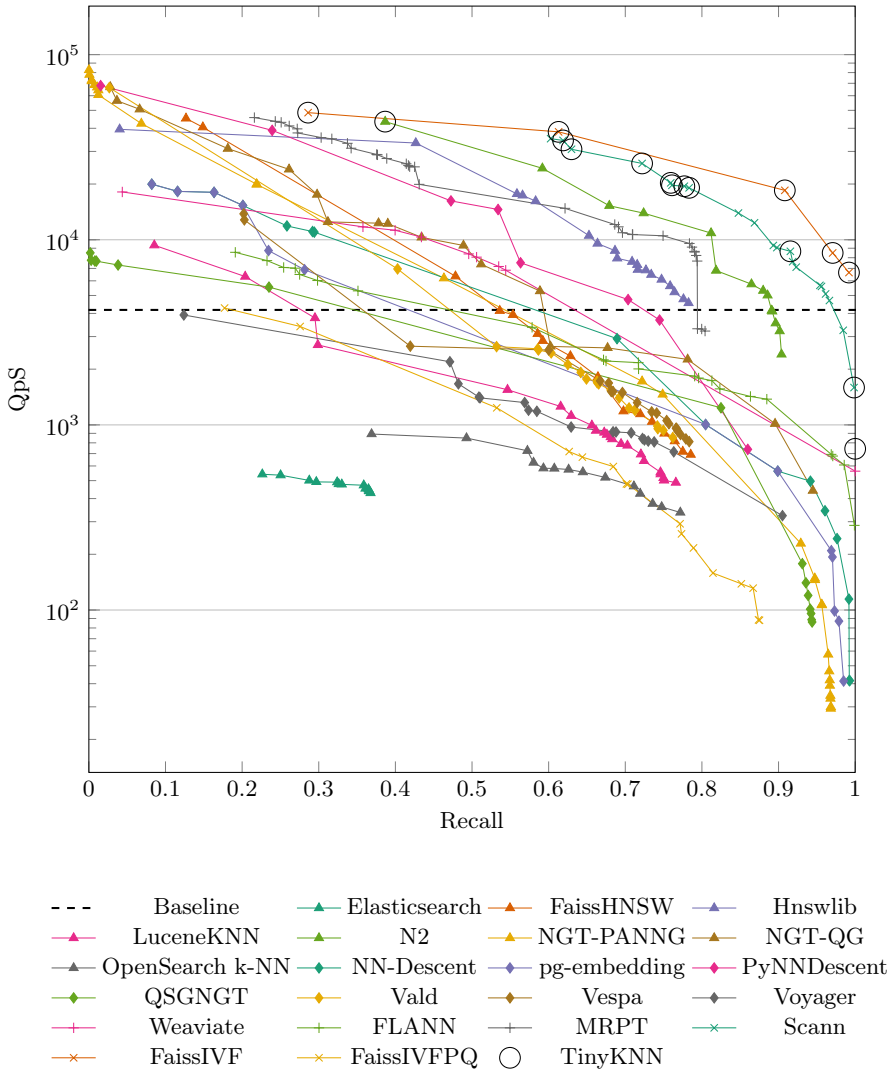


**Fig. 19.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 OMult embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).

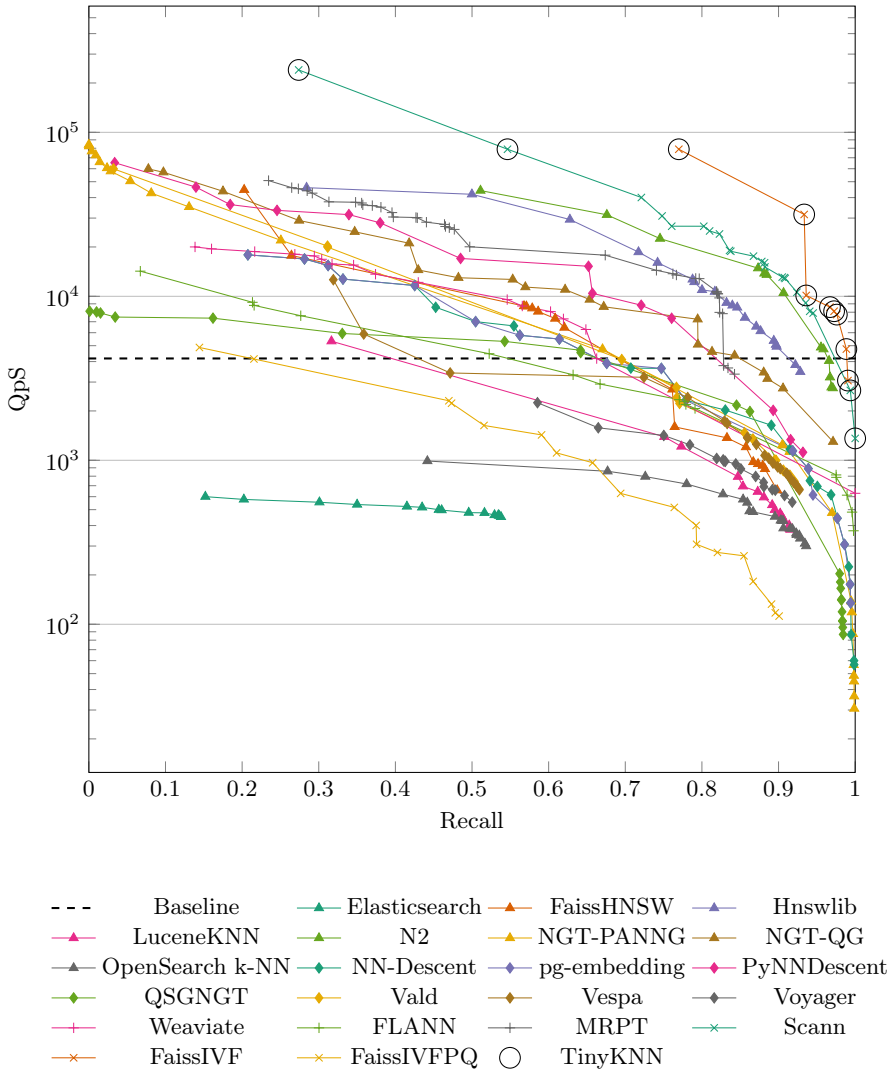


**Fig. 20.** The best configurations for all tested systems and the performance of the baseline on the Yago3-10 Keci embeddings with Euclidean distance. The best configurations for this dataset have been encircled (◯).