Code Context-Based Reviewer Recommendation

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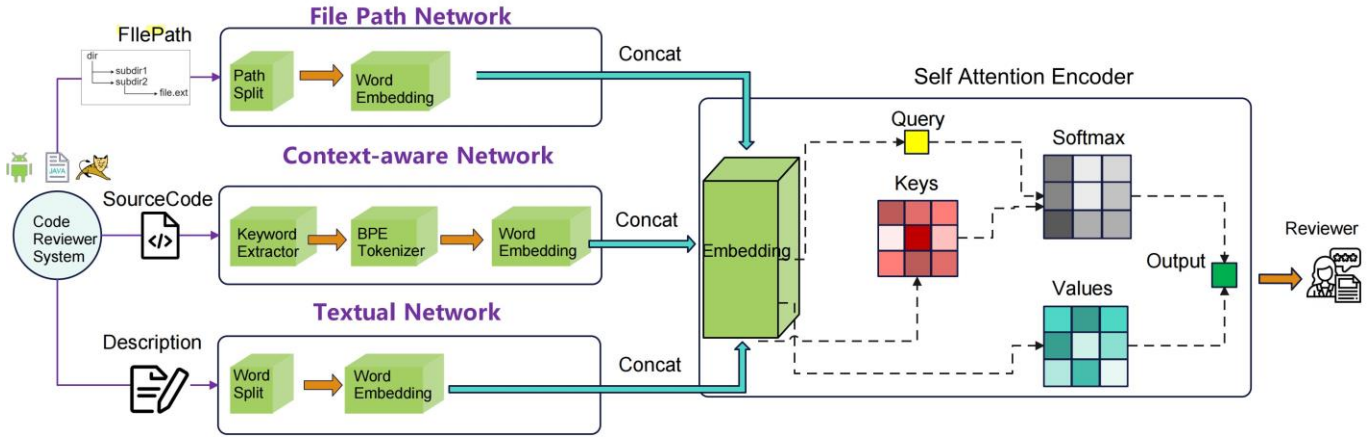
Problems & Ideas

- Problems of traditional code reviewers recommendation approaches:
  - Sole dependence on techniques such as TF-IDF and string comparisons can potentially neglect broader and multifaceted data dimensions.
  - Using string comparisons or traditional methods may not suit diverse reviewer recommendation needs..
  - Ideas: We leverage changeset data, including modified file paths and context, to select suitable reviewers.Additionally, KeyBERT is employed to identify and compare essential keywords within the changesets.



An overview of CCB-RR

Main Contributions

- Contributions:
  - We present a new deep learning-based method for code reviewer recommendations;
  - For the first time, we use source file context for automated reviewer suggestions in pull requests.;
  - Our model, designed with three attention-focused sub-networks, processes diverse data like file paths, pull request details, and source file context to suggest appropriate code reviewers;

Key: I - File Path Network, II - Context-Aware Network, III - Textual Network, F - Full Model

(CCB-RR)

	Top-1				Top-3				Top-5				Top-10				MRR			
Project	**I**	**II**	**III**	**F**	**I**	**II**	**III**	**F**	**I**	**II**	**III**	**F**	**I**	**II**	**III**	**F**	**I**	**II**	**III**	**F**
Android	0.44	0.45	0.27	**0.60**	0.72	0.76	0.67	**0.80**	0.79	0.80	0.75	**0.85**	0.84	0.86	0.86	0.83	0.59	0.61	0.47	**0.71**
OpenStack	0.38	0.34	0.33	**0.55**	0.70	0.76	0.60	**0.72**	0.81	0.80	0.75	**0.81**	0.91	0.88	0.88	0.87	0.67	0.61	0.57	**0.62**
Qt	0.34	0.28	0.30	**0.51**	0.71	0.53	0.56	**0.61**	0.78	0.64	0.64	**0.73**	0.86	0.74	0.74	0.77	0.51	0.45	0.47	**0.52**
LibreOffice	0.43	0.40	0.36	**0.45**	0.60	0.59	0.54	**0.59**	0.67	0.68	0.67	**0.72**	0.77	0.85	0.79	0.80	0.54	0.53	0.49	**0.68**
Average	0.40	0.37	0.32	**0.53**	0.68	0.66	0.59	**0.68**	0.76	0.73	0.70	**0.78**	0.85	0.83	0.82	0.82	0.58	0.55	0.50	**0.63**

The table assesses performance using different metrics: Top-1, Top-3, Top-5, Top-10, and MRR (Mean Reciprocal Rank). Each of these metrics is then broken down to show the scores of the three submodules individually and the full model.