LOCATING BUGS WITHOUT HISTORY

by Tezcan Dilshener

Software Maintenance and Evolution

Computing and Communications Department
The Open University, United Kingdom

IDEs fail to assist developers

- Given the observation of a bug, where is it located?
  - Past version history
    - Deteriorates beyond 20 days[1]
  - Similar bug reports
    - Deteriorates beyond 30 bugs[2]

(1) S. Wang and D. Lo, Version history, similar report, and structure: Putting them together for improved bug localization, ICPC, 2014
(2) B. D. Nichols, Augmented bug localization using past bug information, Proc. 48th Annu. Southeast Reg. Conf. - ACM SE, 2010.

Locating bugs without history

- Can the occurrence of file names in bug reports be leveraged in bug localisation?
  - Key Position in summary
  - Stack Trace in description
  - Textual similarity in source code
  - Comments and stemming

Results that count

- Better results than other State-of-the-Art that used history
  - Evaluated with same 6 projects and 4300+ bug reports

Tool	Top-1	Top-5	Top-10	MAP	MRR
ConCodeSe	**48%**	**70%**	**77%**	**0.46**	**0.68**
AmaLgam	45%	67%	75%	0.43	0.55
BLUiR	41%	62%	71%	0.38	0.51
BugLocator	33%	56%	66%	0.30	0.43
LearnToRank	42%	62%	71%	0.29	0.55

Questions

- Our paper at
  - MSR'16 proceedings page

- Try it out yourselves
  - http://www.concodese.com

- Tezcan Dilshener
  - tezcan@dilshener.de