

Learning to Describe Solutions for Bug Reports Based on Developer Discussions

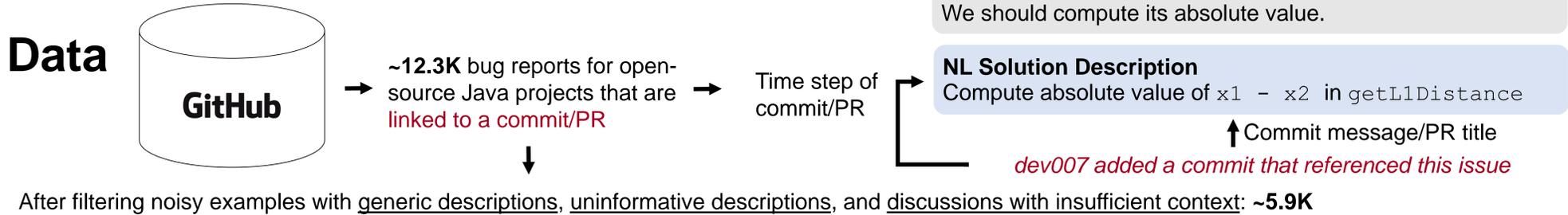
Sheena Panthaplackel (spantha@cs.utexas.edu), Junyi Jessy Li, Milos Gligoric, Raymond J. Mooney
The University of Texas at Austin

Motivation

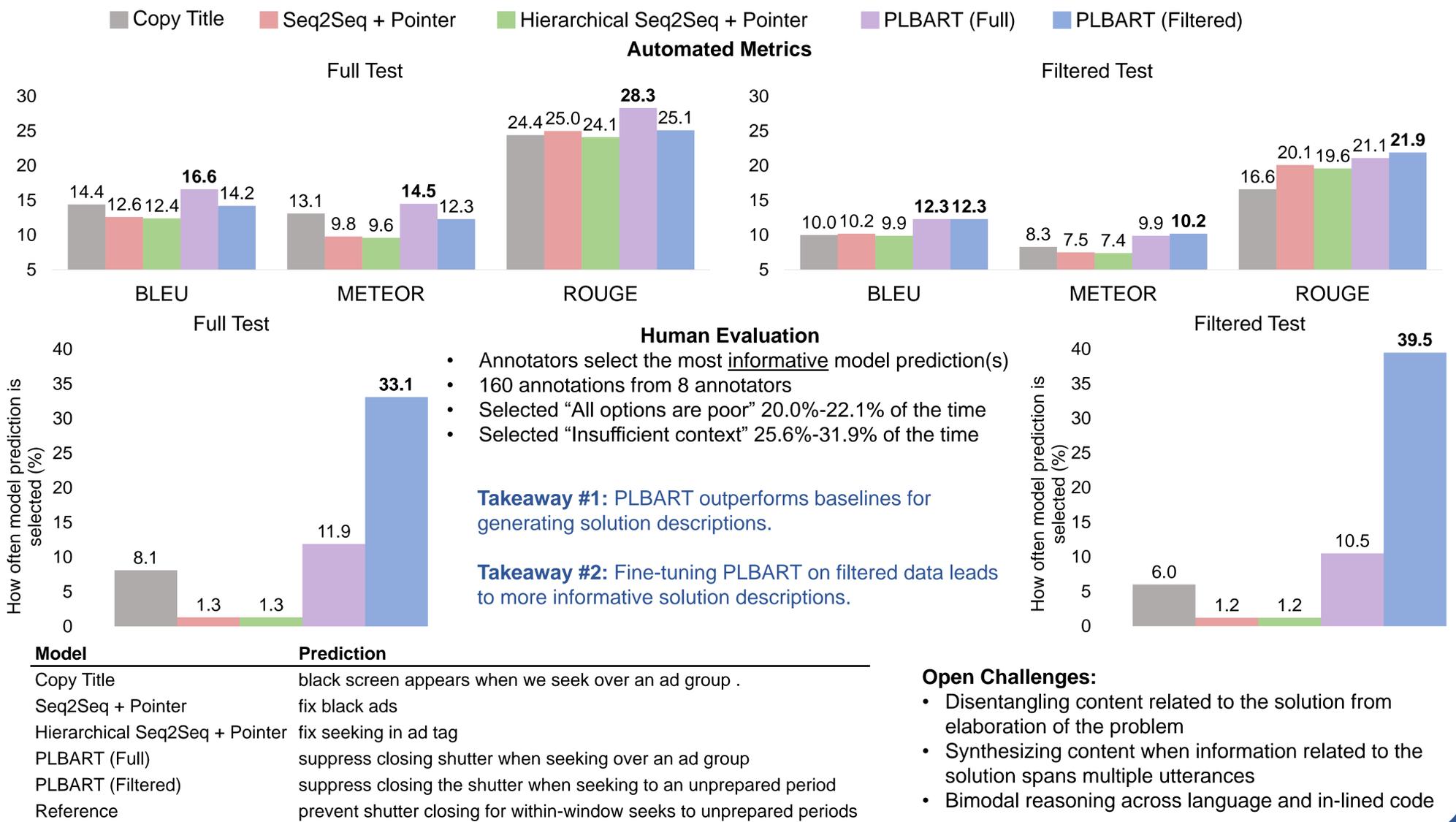
- When a bug is reported, developers engage in a dialogue to collaboratively understand it and ultimately resolve it with the necessary code changes.
- To expedite bug resolution, we aim to guide developers in better absorbing content relevant towards implementing the solution from long bug report discussions.

Task

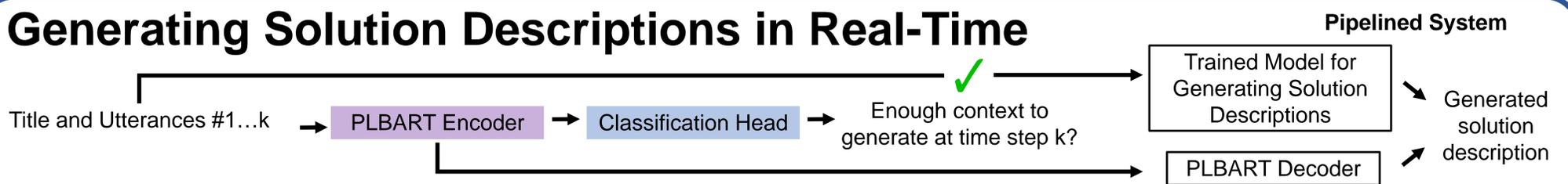
Generate concise natural language description of the solution by synthesizing relevant content in the discussion when it emerges in real-time



Benchmarking Generating Solution Descriptions



Generating Solution Descriptions in Real-Time



Human Evaluation (120 annotations from 60 annotators)	Pipelined	Joint
Scenario #1: System generates at time step k	35.4%	36.4%
Is there sufficient context about the solution at time step k?	39.0%	33.8%
Rate the informativeness of the generated description:		
1 - Incomprehensible, completely incorrect, irrelevant		
2 - Generic, rephrasing the problem	3.3	3.3
3 - Includes some useful information but does not capture the solution		
4 - Partially captures solution		
Scenario #2: System refrains from generating	64.6%	63.6%
Is there sufficient context about the solution at any point in the discussion?	34.2%	37.0%

Takeaway #3: When sufficient context is available, system output is useful.

Takeaway #4: Balancing the trade-off between generating too early and deferring to later time steps is an open challenge.