

Using BiLSTM with attention mechanism  
to automatically detect self-admitted  
technical debt

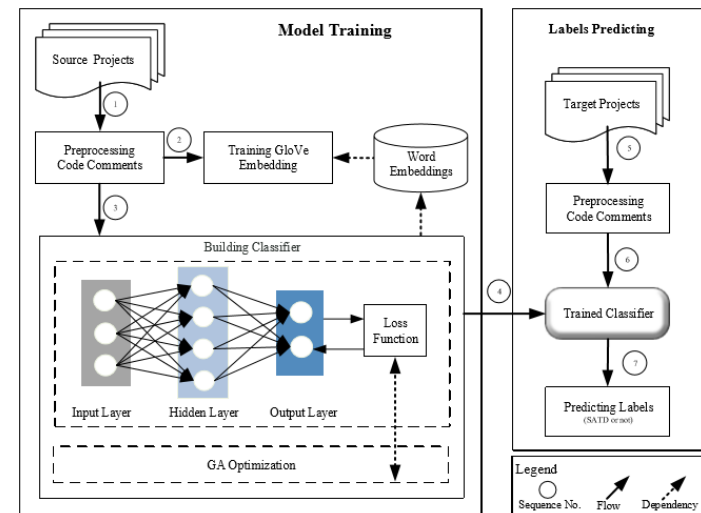
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Frontiers of Computer Science, DOI: [10.1007/s11704-020-9281-z](https://doi.org/10.1007/s11704-020-9281-z)

# Problems & Ideas

- **Problems of detecting self-admitted technical debt**

- Low detection accuracy
- Imbalanced positive/negative sample numbers
- Sharply varied comment lengths



The overall framework of our approach

- **Ideas: Automatically identify self-admitted technical debt**

- Building a classifier to automatically identify self-admitted technical debt.
- Adopting a balanced cross entropy loss function to overcome the class imbalance problem.
- Applying genetic algorithms to adaptively learn the balancing factor of the loss function for improving the expansibility of our approach .

# Main Contributions

- We propose a new approach based on BiLSTM with the attention mechanism to automatically identify self-admitted technical debt.
- We conduct extensive experiments to evaluate the performance of the proposed approach and compare our approach with baseline methods on a public dataset. The results show that our approach outperforms these methods.

**F1-score of all methods on the 10 projects**

<b>Project</b>	<b>Ours</b>	<b>Patterns</b>	<b>NLP</b>	<b>Text Mining</b>
Ant	<b>61.22%</b>	14.08%	52.10%	47.96%
JMeter	<b>84.81%</b>	8.28%	79.00%	81.69%
ArgoUML	<b>87.54%</b>	4.40%	86.80%	83.73%
Columba	<b>91.21%</b>	10.53%	85.90%	84.36%
EMF	<b>60.62%</b>	8.89%	44.70%	50.95%
Hibernate	<b>82.83%</b>	12.23%	80.00%	79.01%
JEdit	<b>55.87%</b>	26.71%	51.70%	43.93%
JFreeChart	<b>73.14%</b>	8.70%	67.00%	69.46%
JRuby	<b>87.36%</b>	8.69%	84.00%	83.98%
Squirrel	<b>73.98%</b>	7.44%	62.90%	67.15%
Average	<b>75.86%</b>	10.99%	69.41%	69.22%