

## ABSTRACT

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In this thesis, we study commented-out code in software and its automatic identification. Commented-out code can inhibit program comprehension which leads to increased maintenance time, commented-out code can have legal ramifications, and degrade the performance of text analysis techniques (among others) that rely on comments. In order to address these issues, we develop a taxonomy on comments and more specifically on commented-out code, we manually verify nearly 3,000 lines of comments, develop an automatic approach to identifying commented-out code based on character frequencies and decision trees, and analyze the prevalence of commented-out code in open-source software. The results of our initial study to develop a model to automatically identify commented-out code boasts scores all greater than 95% (F1 score is 97.89%, precision is 98.32% and recall is 98.23%) on our test and training data. Results of applying our model to additional completely unseen projects gives a respectable precision of 78.03, recall of 99.62 and a F1 score of 87.51. From our study of open-source projects, on average a project lines of commented-code is 4.46% of the total lines of comments (median 2.76) and only four of the 50 projects contained no commented-out code.

This thesis is dedicated to Arthur Grills and the Brothers and Sisters  
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