# Title: Relating change complexity and system complexity

Name

# Abstract

Write this last.

# Introduction

Traditional complexity measures are normalised on or require a whole

file or system and were not designed to measure the complexity of code

fragments. The goal of this paper would be to evaluate which measures

are the best indicators of the complexity of an evolving system. One

point to note is that the complexity of a change can be very

different from the complexity of the files or system that contain a

change (e.g., a change to many simple files might be as complex as a

change to one difficult file). Change complexity is related to, for

example, "how hard is it to understand and review a change" vs system

complexity, which measures for example, "how hard is to understand and

potentially modify the system".

Furthermore, traditional complexity measures are not really

measuring the complexity of the system but simply the size of the files that make up the system. As a result, they do not add any additional information beyond how large a file is.

In contrast, all of the change complexity measures are based upon the notion that changes that are farther

from each other or involve multiple entities are more complex than those closer

together involving fewer entities. In total, we use seven measures of change

complexity: the churn (or size), the number of modified files in a diff, the

number of diffs per review, the number of and distance between contiguous

change blocks within a diff (\ie hunks), the directory distance between these

files, and depth of indentation of a change (Hindle2008ICPC).

In this work, we answer the following research questions:

1. One short sentence that summarizes the question
2. You should have 1 to 3 questions, no more

The paper is organized as follows. In Section II, we describe … In Section III, we …

# Measures

# Background/Literature

Brief paragraphs on each traditional complexity measure

# Change Complexity Measures

Copy from my thesis and elaborate

# Methodology

Diagram showing sum of System and change complexity measures … (see email discussion)

# Results

# Discussion

# Conclusion