

# **DATASET VERSIONING THROUGH CHANGELOG ANNOTATION**

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November 2016  
(For Graduation December 2017)

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# CONTENTS

LIST OF TABLES . . . . .	iv
LIST OF FIGURES . . . . .	v
ACKNOWLEDGMENT . . . . .	vi
ABSTRACT . . . . .	vii
1. INTRODUCTION . . . . .	1
1.1 This is a Section Heading . . . . .	2
1.1.1 This is a Subsection Heading . . . . .	2
1.1.1.1 This is a Subsubsection Heading . . . . .	3
2. PREVIOUS WORK . . . . .	4
2.1 This is a Section Heading . . . . .	5
2.1.1 This is a Subsection Heading . . . . .	5
REFERENCES . . . . .	6
APPENDICES	
A. THIS IS AN APPENDIX . . . . .	7
A.1 A Section Heading . . . . .	7
B. THIS IS ANOTHER APPENDIX . . . . .	8

## LIST OF TABLES

1.1	This is the Caption for Table 1 . . . . .	2
2.1	This is the Caption for Table 2 . . . . .	5

## LIST OF FIGURES

1.1	This is the Caption for Figure 1 make it long to illustrate how it looks when wrapped around to the next line . . . . .	2
2.1	A Shorter Caption for the List of Figures . . . . .	4

## ACKNOWLEDGMENT

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## ABSTRACT

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# CHAPTER 1

## INTRODUCTION

Dataset versioning is the process by which changes to data are tracked and documented. Version numbers are commonly seen in relation to new releases of software such as MATLAB or R, but current version naming schemes borrow from software contexts. While it may have been possible to manually manage the changes to data when datasets were relatively small, research centers must now supervise on the order of tens of millions of files with changes being made at rates of thousands of processing jobs per day.

Versioning information is widespread across devices and software in the modern world. From the numbering of the latest smart phone to the patch number of the newest release of MATLAB, scientists must deal with a range of labels and formats when performing their research. Science data, likewise, also has a tendency to change. Datasets are subjected to data audits and error corrections regularly to maintain a level of data quality.

Agencies and research groups have collected new data at an incredible rate. The amount of data housed by NASA quadrupled from 2001 to 2004 [4] and high energy physics labs can generate on the order of 4000 new datasets every day [5].

Provenance is the data used to describe the origin of an object (Merriam Webster). While data provenance and data versioning are related, the priorities of one should not be confused with the other. Understanding the origins of a dataset and the activities leading to its creation may inform why two data objects are different, the changes made do not take priority. Many different views of versioning has appeared in the literature. When Barkstrom and various other experts refer to data versioning, they are actually referring to data provenance.

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Please refer to Figure 1.1.

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**Figure 1.1:** This is the Caption for Figure 1 make it long to illustrate how it looks when wrapped around to the next line

**Table 1.1:** This is the Caption for Table 1[1]

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of	a	table
floated	with	the
<b>table</b>	environment	command.

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#### **1.1.1.1 This is a Subsubsection Heading**

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<sup>1</sup>Here's the text of the footnote.

## CHAPTER 2

### PREVIOUS WORK

PROV is a W3C recommendation that deliniates a method to express data provenance with semantic technologies. Using the model of relating activities, agents, and entities, data managers can express the origins of their datasets. However, when an entity is revised, the PROV data model can only express the relationship as a revision or that the new dataset was derived from the original. This leaves

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**Figure 2.1:** This is the Caption for the First Figure in Chapter 2. It is a long, long caption; we do not want to put the whole thing in the List of Figures. A Shorter Caption can go in the square brackets.

**Table 2.1: This is the Caption for Table 2**

Here's	another	example
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## 2.1 This is a Section Heading

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<sup>2</sup>Here's the text of the footnote.

<sup>3</sup>Here's the text of the footnote.

## REFERENCES

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- [2] The second item in the Bibliography.
- [3] Another item in the Bibliography.
- [4]
- [5]

## APPENDIX A

### THIS IS AN APPENDIX

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#### A.1 A Section Heading

This is how equations are numbered in an appendix:

$$x^2 + y^2 = z^2 \tag{A.1}$$

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## **APPENDIX B**

### **THIS IS ANOTHER APPENDIX**

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