

# AP Codes: Low Overhead Erasure Code Using Approximate Recovery

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**Abstract**—Erasure codes are commonly used in large-scale data storage systems. Current erasure code schemes use an extra number of parity disks to tolerate multiple disk failures, which is expensive because it is very rare for multiple disks to be corrupted at the same time. We present AP (short for Approximation) codes that can approximately tolerate disk-level failures with little additional storage overhead for files such as video.

Video data such as autopilot or security monitoring occupies a large amount of storage space, however the current erasure code scheme does not take into account the redundant information and fault tolerance contained in the video data. For encoded video data, errors at different segments have different effects on the decoding quality of the video. We only apply parity blocks to key data segments in the video. By allowing the loss of certain non-critical data segments, we can approximately tolerate disk failures with little additional storage overhead.

**Index Terms**—Erasure Codes, Approximate Storage, Video Storage, Low Overhead

## I. INTRODUCTION

This document is a model and instructions for L<sup>A</sup>T<sub>E</sub>X. Please observe the conference page limits.

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Number equations consecutively. To make your equations more compact, you may use the solidus ( / ), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in:

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- The subscript for the permeability of vacuum  $\mu_0$ , and other common scientific constants, is zero with subscript formatting, not a lowercase letter “o”.
- In American English, commas, semicolons, periods, question and exclamation marks are located within quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)
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- There is no period after the “et” in the Latin abbreviation “et al.”.

- The abbreviation “i.e.” means “that is”, and the abbreviation “e.g.” means “for example”.

An excellent style manual for science writers is [7].

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TABLE I  
TABLE TYPE STYLES

Table Head	Table Column Head		
	<i>Table column subhead</i>	<i>Subhead</i>	<i>Subhead</i>
copy	More table copy <sup>a</sup>		

<sup>a</sup>Sample of a Table footnote.

Fig. 1. Example of a figure caption.

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#### ACKNOWLEDGMENT

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#### REFERENCES

Please number citations consecutively within brackets [1]. The sentence punctuation follows the bracket [2]. Refer simply to the reference number, as in [3]—do not use “Ref. [3]” or “reference [3]” except at the beginning of a sentence: “Reference [3] was the first ...”

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#### REFERENCES

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