# A Survey of Error Correcting Codes in Computer Networks

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## 1 Introduction

## 2 Motivation for Error Control

### 2.1 Use Cases

Wireless channels, high delay channels, physical media

### 2.2 Types of Errors

Bursts vs single bit

### 2.3 Advantages of EC

### 2.4 Disadvantages of EC

## 3 Background on Error Control

### 3.1 The Theory

In this section, briefly go into the math of the Shannon limit and its implications. Discuss how DNA actually has error correction with amino acid translation

### 3.2 Types of Error Control

Discuss block vs convolutional Discuss hard vs soft

## 4 Block Codes

### 4.1 Simple Error Control Using Redundant Data

Demonstrate that redundant data is the simplest way to send additional data.

### 4.2 Hamming Codes (4, 7)

Discuss Hamming codes and how they are used. Draw diagrams. Expand to Golay to show how it goes.

### 4.3 Reed-Solomon Codes

## 5 Convolutional Codes

### 5.1 Viterbi codes

### 5.2 Turbo Codes

## 6 Conclusion