Maximum likelihood decoding and communicating using carrier pigeons

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ABSTRACT: A fundamental concept in secure communication of data is the ability to *detect* and *correct* errors. In this report, we analyse a sophisticated error detection and correction algorithm when the communication medium consists of written messages tied to the legs of carrier pigeons.

1 Introduction

There are many methods of high-speed communication in use today, including ethernets, telephones and radiowaves. However, a very common method of transmitting data is via the use of messages tied to the legs of carrier pigeons. Unfortunately, there are many sources of error possible using this techniques. These sources include the pigeons being waylaid by cats, being sidetracked by birdseed, or even being collected by imbecilic cricket commentators. For a comprehensive analysis of potential errors in the pigeon network, see [1].

It has been estimated [2] that the reliability of a pigeon-based communication channel is only 50%, with the reliability reducing with the square of the distance travelled. In this report, we consider the problem of increasing this reliability. We discuss previous methods which have been used, and present an analysis of each. In addition, software has been written to simulate transportation using a flock of between 1 and 10 pigeons. A copy of the code is given in the Appendix, and results of the simulations are presented in Section 3.

2 A brief history of pigeon-based communication

Since ancient times, pigeons have not only been good to eat, but they have also played a major role in reliable, long-distance communications.....

3 Reliability of communication

It is well-known (see [2]) that there are many reliability issues when using pigeons for communication.....

Many methods have previously been proposed to overcome these problems, including....

The most widely accepted method for increasing reliability is to use a flock of pigeons of size n (n maybe as large as 5 or 10) to implement more reliable communication. For many applications, $n = 3$ is enough, but for more important information.....

4 Some simulations and results

To investigate the effectiveness of redundancy in communication, some software has been developed. This software provides a simulated implementation of....

The algorithm chosen in the implementation is.... This was a good/bad choice, because....

The software was used to perform a comprehensive test of.... The results obtained are:

(some results)

An analysis of these results shows that.....

5 Conclusions

As has been shown, there are exciting developments in the field of reliable pigeon-based communications. The conclusion is probably important! Make it good.

And this whole conclusion should end with a snappy and concise statement about something or other! [1]

References

[1] W.M. Lawry, *On the errors in a pigeon-based communication protocol*, Australasian Journal of Electronic Applications of Pigeons **7** (1991), 175–187.

[2] Bob Smith and Jim Jones, *Cats, birdseed, cricket commentators, pigeons and reliable communication*, Abyssinian Cat-lover's Journal (in press).

6 Appendix

An integral part of this work is the development of a comprehensive 'pigeon-simulator' software suite. Here is a copy of the code, with a brief description of the required input and the resulting output. An obvious improvement is to extend the functionality by simulating pigeons with four legs.

```
main(argc,argv)
/* Code to simulate a pigeon */
.
.
.
.
.
.
```

[1] rather than just trailing limply off like a dead jellyfish