



WHO KILLED THE SOMERTON MAN?

Background

On December 1st, 1948, an unknown man was found deceased, on Somerton Beach in Adelaide. A piece of paper with 4 lines of mysterious letters was found in his pocket, and was speculated that this was a copy of a code or cipher. However, the identification and the reason why he died is still unknown, till this day.



Figure 1. Somerton man

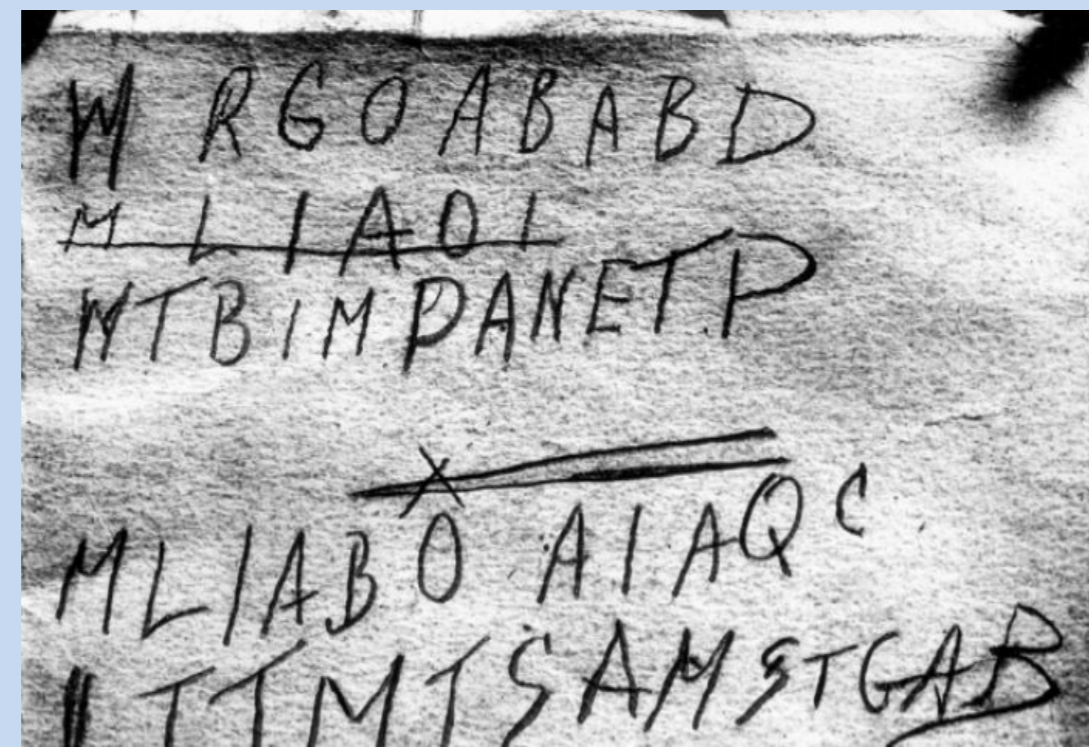


Figure 2. Mysterious code

Aim

Three engineering tasks were completed during this project.

- Analysis of the mysterious codes
- Mass spectrometer analysis on the hair samples
- Degradation of DNA samples

Motivation

- To solve a 70-year-old case
- Find out the real identification of the Somerton Man
- Show respect to his family

Task 1: Cipher Cracking

Strong evidence shows the code refers to horse names

1. Different types of collective objects
2. Statistical analysis was performed
3. P-value test between collective objects and the code
 - Null hypothesis: Horse names
 - Alternative hypothesis: Not horse names
4. Results were analysed and graphed



Figure 3. Comparison between mysterious code and horses' name

The graph shows that there is a high probability that the mysterious code is **NOT HORSE NAMES**

Task 2: Mass Spectrometer

Five different hair samples were gathered, to perform the mass spectrometer experiment. Strontium was the element of concern, as Adelaide has high levels of strontium in the soil. The comparison of the of strontium in the different samples is shown below.

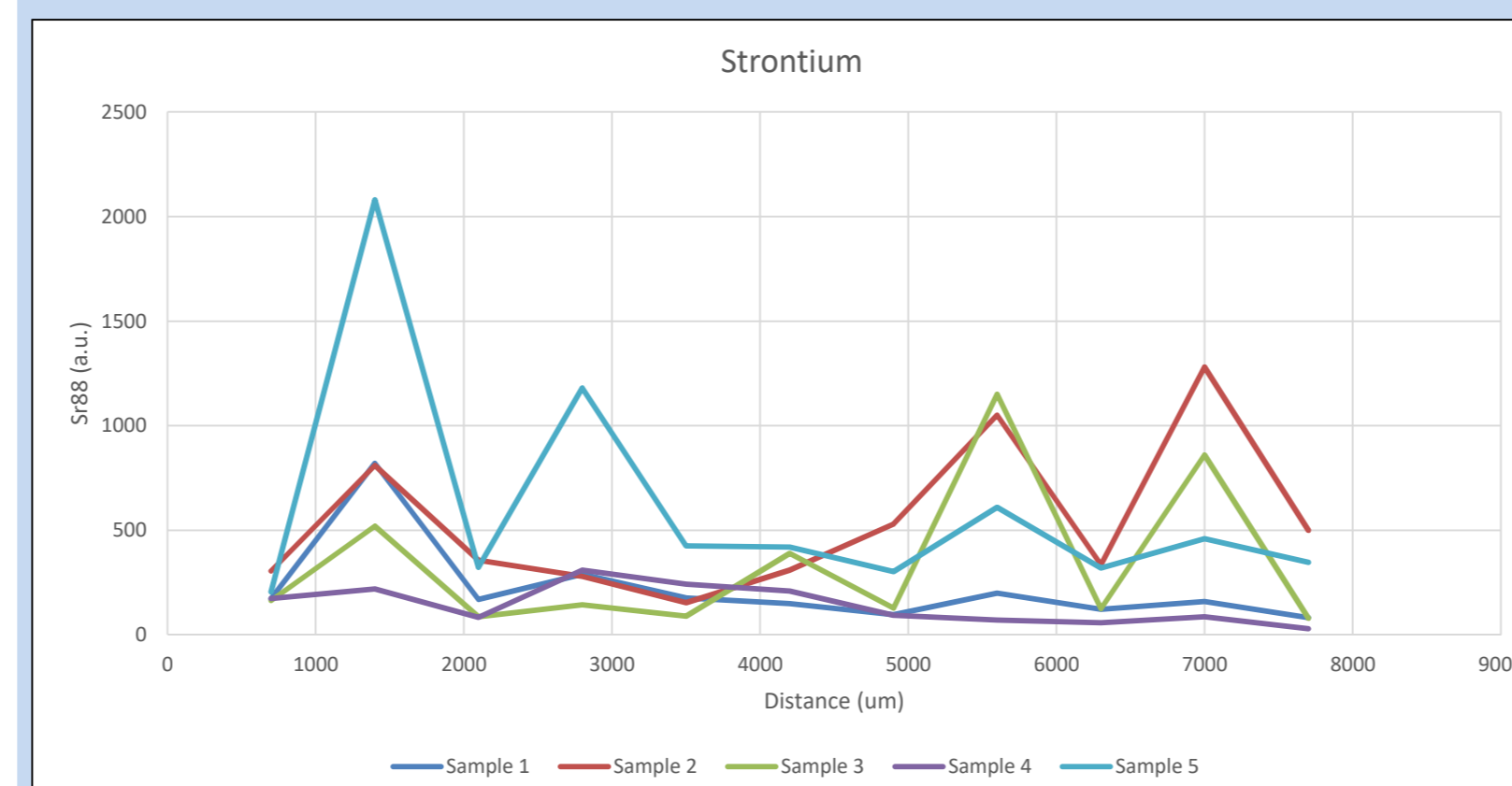


Figure 4. Different Strontium level in various samples

Task 3: DNA Samples Analysis

Two sub-tasks were completed, including heritage application and false positive, false negative investigation

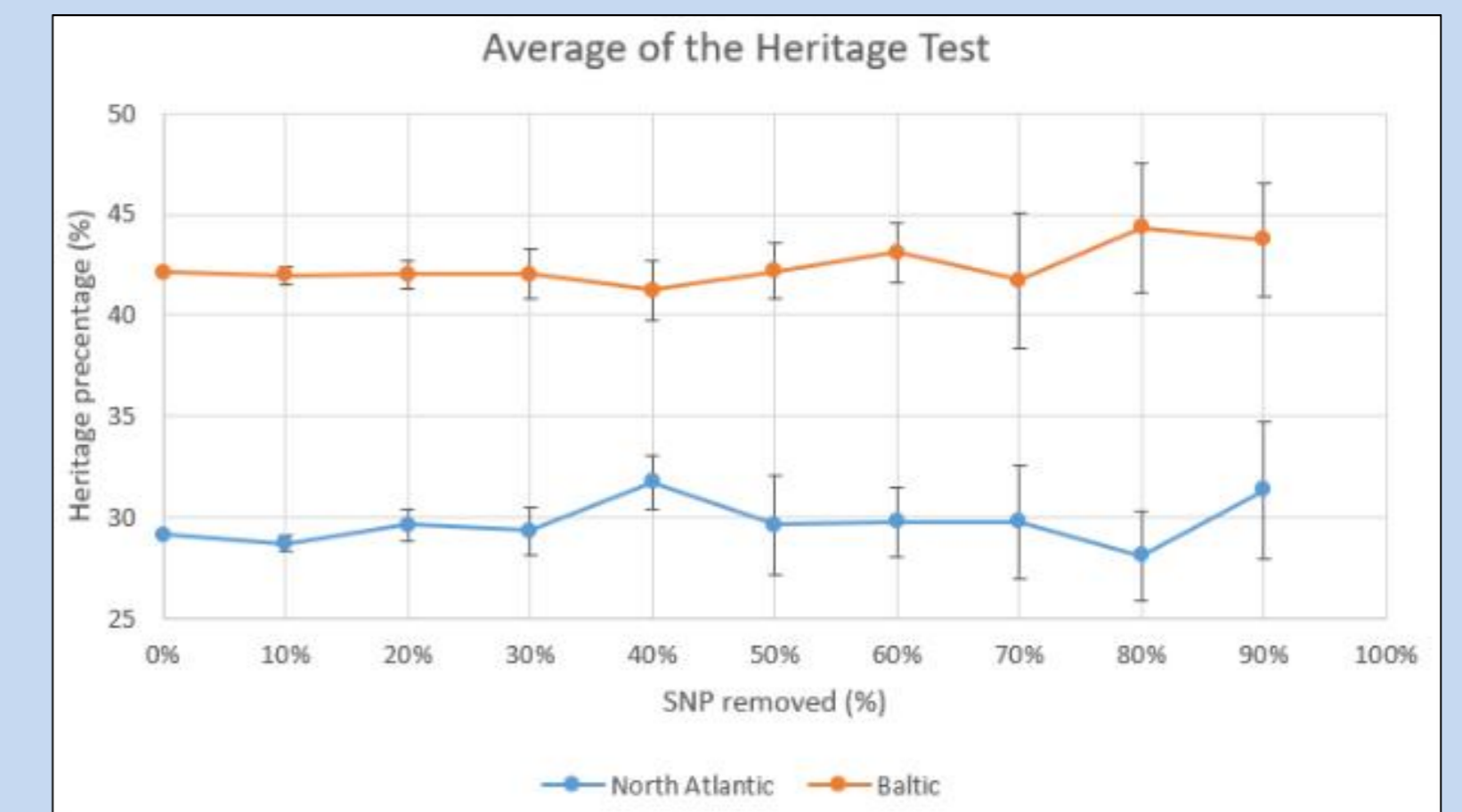


Figure 5. Average result of heritage data

The graph shows the DNA samples seem to be unreliable after degrading 50% of the sequences due to the high error bar index.

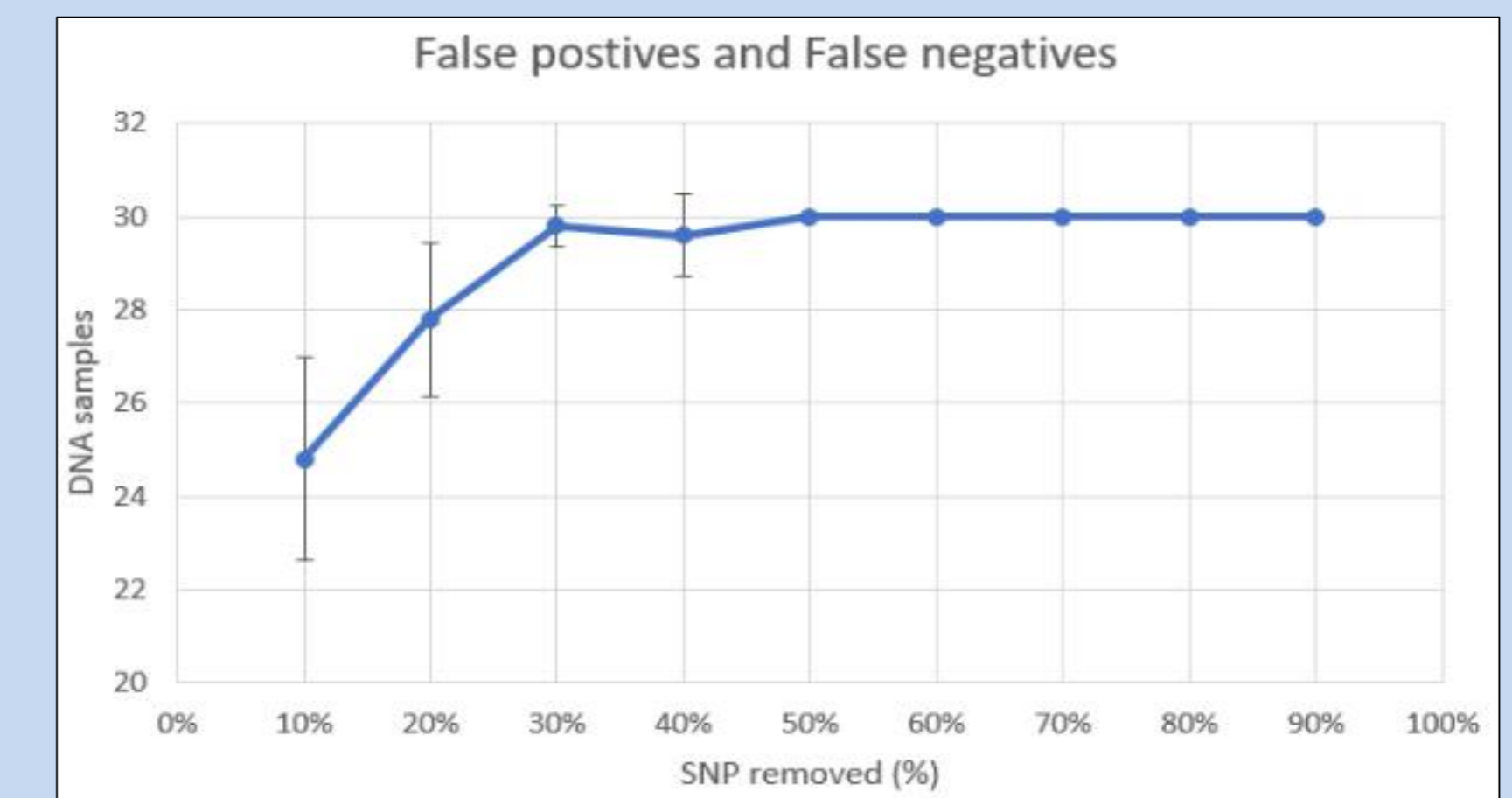


Figure 6. Result of false positives and false negatives

The graph above demonstrates that none of the degraded DNA cases above 50% matches with the original case.

Conclusion

- Task 1: The mysterious code is not horse names
- Task 2: No solid conclusion were found. Future investigation is required
- Task 3: DNA becomes unreliable when degraded greater than 50%

Reference

- Figure 1: J. Bineth. "Somerton Man cold case," ABC news, 14th December 2017, Available: <http://www.abc.net.au/news/2017-12-14/somerton-man-cold-case-could-be-one-step-closer-to-solved/9245512>
- Figure 2: "Tamam Shud/ Somerton Man," Available: <http://ciphermysteries.com/tamam-shud-somerton-man>