Source tracker

Izaak van Dongen

March 9, 2018

Source	Source content	Source evaluation
Error detecting and error correcting codes [Hamming, 1950]	This is a paper by R. W. Hamming, who contributed much to modern error-correcting codes. One of the main encoding types used in my project is even named the Hamming code. It has formed much of the basis of modern communication theory and can certainly be trusted.	daadsf ads fads fadsf asdf ads fasdf daadsf ads fads fadsf asdf ads fasdf daadsf ads fads fadsf asdf ads fasdf daadsf ads fads fadsf asdf ads fasdf
A mathematical theory of communication [Shannon, 1948]	This paper, together with [Hamming, 1950] are generally considered to be the seminal works on coding theory. This lays much of the groundwork for communication theory and gives a more general definition of the Hamming Code.	
Generalized dna barcode design based on hamming codes [Bystrykh, 2012]	This article is very much relevant to what my project is about. It doesn't seem to be very clear though, and it uses a seemingly inoptimal form of parity. However it provides helpful insight into what actual researchers in the field are doing and have done with these ideas.	
Introduction to coding theory [Guruswami, 2010]	This is not a very good academic source but gives a good informal overview of coding theory.	
Polynomial codes: an optimal design for high-dimensional coded matrix mul- tiplication [Yu, Maddah-Ali and Avestimehr, 2017]	This source is very technically detailed, which isn't necessarily a bad thing but makes it pretty dense. Potentially very useful for a complicated understanding of polynomial codes, although I'm not sure if I'll use polynomial codes.	

Families of hadamard z2z4q8-codes [del Río and Rifà, 2012] This source turned out not to be very useful as it only relates to a highly specific class of Hadamard code. Other simpler tutorials on the internet are much more useful.

Hadamard matrices and their applications [Hedayat and Wallis, 1978] This is a far more appropriate paper that gives a more general overview of what a hadamard matrix is and can be used for. Very useful overall.

The search for hadamard matrices [Golomb and Baumert, 1963]

This paper gives a very good overview of Hadamard's original construction of the $2^n \times 2^n$ matrices.

Hadamard matrices and their designs: A coding-theoretic approach [Assmus and Key, 1992] This paper gives a number of very mathematically involved constructions of Hadamard matrices. I didn't end up using any of these but it provided a useful further background around Hadamard constructions.

Hadamard designs [Spence, 1972]

This paper is about Hadamard designs for alphabet sizes of n where $n \neq 2$. This is potentially very useful information as I am concerned with DNA barcodes, ie n = 4.

Lifted polynomials over F_{16} and their applications to dna codes [Oztas and Siap, 2013]

Codes, not ciphers [Baylis, 2010]

Error correcting codes: Practical origins and mathematical implications [Pless, 1978]

Boole and the algebra of logic [Kneale, 1956]

This isn't a very mathematically advanced source but my project doesn't need to be very highly complex in this area. This is used for a quick citation on how I can adapt Hadamard generation with additive negation to the Boolean (algebra) system used by computers.

The degeneracy of the genetic code and hadamard matrices. [Petoukhov, 2008]

Construction of multilevel hadamard matrices with small alphabet [Trinh and Fan, 2008]

Decoding the hamming code [Ehrenborg, 2006]

1

References

Assmus, E. F. and Key, J. D. [1992], 'Hadamard matrices and their designs: A coding-theoretic approach', *Transactions of the American Mathematical Society* **330**(1), 269–293.

URL: http://www.jstor.org/stable/2154164

Baylis, J. [2010], 'Codes, not ciphers', The Mathematical Gazette 94(531), 412–425.

URL: http://www.jstor.org/stable/25759725

Bystrykh, L. V. [2012], 'Generalized dna barcode design based on hamming codes', $PLOS\ ONE$. URL: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0036852

del Río, Á. and Rifà, J. [2012], 'Families of hadamard z2z4q8-codes', CoRR abs/1211.5251.

URL: http://arxiv.org/abs/1211.5251

Ehrenborg, R. [2006], 'Decoding the hamming code', Math Horizons 13(4), 16–17. URL: http://www.jstor.org/stable/25678619

Golomb, S. W. and Baumert, L. D. [1963], 'The search for hadamard matrices', *The American Mathematical Monthly* **70**(1), 12–17.

URL: http://www.jstor.org/stable/2312777

Guruswami, V. [2010], 'Introduction to coding theory'.

URL: http://www.cs.cmu.edu/venkatg/teaching/codingtheory/notes/notes1.pdf

Hamming, R. W. [1950], 'Error detecting and error correcting codes', The Bell System Technical Journal **26**(2), 147–160.

URL: http://sb.fluomedia.org/hamming/

Hedayat, A. and Wallis, W. D. [1978], 'Hadamard matrices and their applications', *The Annals of Statistics* **6**(6), 1184–1238.

URL: http://www.jstor.org/stable/2958712

Kneale, W. [1956], 'Boole and the algebra of logic', Notes and Records of the Royal Society of London 12(1), 53-63.

URL: http://www.jstor.org/stable/530792

Oztas, E. S. and Siap, I. [2013], 'Lifted polynomials over F_{16} and their applications to dna codes', Filomat 27(3), 459-466.

URL: http://www.jstor.org/stable/24896375

Petoukhov, S. V. [2008], The degeneracy of the genetic code and hadamard matrices.

URL: https://arxiv.org/pdf/0802.3366.pdf

Pless, V. [1978], 'Error correcting codes: Practical origins and mathematical implications', The American Mathematical Monthly 85(2), 90–94.

URL: http://www.jstor.org/stable/2321784

Shannon, C. E. [1948], 'A mathematical theory of communication', *The Bell System Technical Journal* **27**, 379–423, 623–656.

URL: http://affect-reason-utility.com/1301/4/shannon1948.pdf

Spence, E. [1972], 'Hadamard designs', Proceedings of the American Mathematical Society 32(1), 29–31. URL: http://www.jstor.org/stable/2038298

Trinh, Q. and Fan, P. [2008], 'Construction of multilevel hadamard matrices with small alphabet', 44, 1250 – 1252.

Yu, Q., Maddah-Ali, M. A. and Avestimehr, A. S. [2017], 'Polynomial codes: an optimal design for high-dimensional coded matrix multiplication', CoRR abs/1705.10464.

URL: http://arxiv.org/abs/1705.10464