

Comparisons of Detection Schemes for Channels with Varying Offset

Bu, Renfei; Weber, Jos

Publication date

2019

Document Version

Final published version

Citation (APA)

Bu, R., & Weber, J. (2019). *Comparisons of Detection Schemes for Channels with Varying Offset*. 8. Abstract from 11th Asia-Europe Workshop on Concepts in Information Theory, Rotterdam, Netherlands.

Important note

To cite this publication, please use the final published version (if applicable). Please check the document version above.

Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights. We will remove access to the work immediately and investigate your claim.

Detection Scheme for Channels with Unknown Varying Offset

Renfei Bu

Jos Weber

Delft University of Technology

Applied Mathematics Dept., Optimization Group

Van Mourik Broekmanweg 6, 2628 XE Delft, The Netherlands

R.Bu@tudelft.nl

J.H.Weber@tudelft.nl

Pearson distance-based detection [1] has been proposed to counter the effects of gain and/or offset mismatch in noisy channels, where the gain and the offset may change from word to word, but are constant for all transmitted symbols within a codeword. Here, we consider the situation where the offset varies linearly within a codeword. A detection technique for such channels is investigated in [2], where Pearson distance-based detection is used in conjunction with mass-centered codewords.

In this paper, we show that the use of Pearson distance-based detection in cooperation with a difference operator also offers immunity to gain and varying offset mismatch. In addition, pair-constrained codes are proposed for unambiguous decoding, where in each codeword, certain adjacent symbol pairs appear at least once. We investigate the cardinality and redundancy of these codes. The redundancy of pair-constrained codes is much lower than that of prior art mass-centered codes, which makes the new decoding scheme an attractive alternative for practical applications.

References

- [1] K. A. S. Immink and J. H. Weber, “Minimum Pearson Distance Detection for Multilevel Channels with Gain and/or Offset Mismatch,” *IEEE Transactions on Information Theory*, vol. 60, no. 10, pp. 5966-5974, Oct. 2014.
- [2] K. A. S. Immink and V. Skachek, “Minimum Pearson Distance Detection Using Mass-Centered Codewords in the Presence of Unknown Varying Offset,” *IEEE Journal on Selected Areas in Communications*, vol. 34, no. 9, pp. 2510-2517, Sep. 2016.