Some Notes on the Context Mapping Function in Lossless Data Compression

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Abstract

One of the major challenges when applying (serial) universal source coding to 2-dimensional data, e.g., images, is to determine suitable context data. For this reason the concept of Context Mapping Function (CMF) has been introduced. In this paper we discuss the foundation for CMFs as well an off-line construction method via a combinatorial optimization method.

1 Introduction

The problem of selecting a suitable context to the context modeling of a data compression system is an open problem. Some investigations have been made along with some fundamentals in [WLZ92] and [WS96].

For applications in lossless image compression we have seen many ad-hoc methods during the last decade. There are two main reasons for this: 1) it is hard to improve the compression performance; 2) the images are, by nature, limited in size and thus we do not have an infinite amount of data available. The second reason makes it profitable to be able to include more image data knowledge in the modeling.

In this article we present a scheme for constructing a context mapping function ([Eks98]) off-line which will enable us to improve compression performance for specific applications.

References

