**Lossless Data Hiding Based on Histogram Modification for Image Authentication**

**ABSTRACT**

Lossless data hiding enables the embedding of messages in a host image without any loss of content. In this paper, we present a lossless data hiding technique based on histogram modification for image authentication that is lossless in the sense that if the marked image is deemed authentic, the embedding distortion can be completely removed from the marked image after the embedded message has been extracted. This technique uses characteristics of the pixel difference to embed more data than other histogrambased lossless data hiding algorithms. We also present a histogram shifting technique to prevent overflow and underflow problems. Performance comparisons with other existing lossless data hiding schemes are provided to demonstrate the superiority of the proposed scheme.

***Keywords:*** Lossless data hiding, image authentication, reversible, self-authentication, fragile watermarks