

Optimizations of Reconfigurable Systems Through the Exploitation of the Hough Transform

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Abstract

Many breakthroughs have been made in Reconfigurable Computing (RC). However, it remains a challenge to determine a good Field Programmable Gate Array based architecture for groups of algorithms within an application domain. Although each application has needs that may differ tremendously, memory access is a key element in nearly all digital systems. Customizing caching schemes permits digital systems to take advantage of characteristics, or patterns, exhibited by a particular application. The Hough Transform (HT) is a robust and computationally intense image-processing algorithm used often for detecting features. In this paper, the HT for lines was chosen. A methodology is outlined for memory access optimizations for algorithms exhibiting non-sequential memory usage patterns.