عنوان مقاله:

GPU-Based Parallel Algorithm for Wideband Signal Timing Recovery

محل انتشار:

سیزدهمین کنفرانس بین المللی فناوری اطلاعات،کامپیوتر و مخابرات (سال: 1400)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Mohammad Hasan Shammakhi - *Department of Electrical Engineering Amirkabir University of Technology*

Parnia Haji Faraji - *Department of Electrical and Computer Engineering University of British Columbia*

Milad Mohammadi Bidhandi - *Department of Electrical Engineering Amirkabir University of Technology*

Mohsen Hosseinzadeh - *Department of Electrical Engineering Amirkabir University of Technology*

خلاصه مقاله:

Symbol timing recovery is a complex calculation process that detects and corrects timing error in a coherent receiver. This paper presents a new implementation of GPU-based symbol timing recovery based on the parallel version of Gardner’s method to minimize the timing error. Gardner’s method utilizes a sequential process that relies on feedback error. The proposed method is a fast parallel implementation method on a GPU for time-error detection (TED) using the parallel timing recovery structure of sample signal blocks which makes fast error detection possible. We calculate the interpolation filter coefficients before timing recovery to detect the timing error of the symbols. We then compare the performance of timing recovery for different parallel techniques on different GPUs to minimize error and improve processing speed, up to ۱۰۰ times, compared to Gardner's method. Performance evaluations show that we achieved a very high rate of timing recovery (۵۰ Msymb/sec on GTX ۱۰۵۰ Ti) by optimizing the GPU implementation

کلمات کلیدی:

Gardner’s method, timing recovery, GPU, Cuda, synchronization, coherent receiver, digital communication