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High-Speed Image Acquisition System for Real-time Plasma Control on EAST

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In order to realize plasma boundary reconstruction and plasma shape control based on visible camera, a high-speed camera acquisition system was developed on EAST. This system is optimized in many ways to achieve high-speed, real-time, low-latency performance, and can simultaneously load multiple acquisition cards. The acquisition rate of this system can be close to 10,000 FPS where the frame size set as 8-bit@320*240. And the system uses DMA and optimized memory copy function in data transmission, reducing the time spent on data memory reading and writing. Besides, the visual display function of the system based on Python web can communicate with the acquisition machines, synthesize data of multiple acquisition machines in near real-time and perform image fusion and access display. About the data storage, the system optimizes the data storage format and provides a GUI for offline data analysis and processing based on Matlab.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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