318. LIFE TIME ENHANCEMENT TECHNIQUE FOR PCM BASED IMAGE

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Emerging nonvolatile memories such as phase change memory (PCM) have the potential to replace internal memories in embedded devices. In this brief, we propose to use PCM as image buffer in application-specific multimedia systems. To improve the lifetime of PCM-based image buffer, we first eliminate redundant writes using data comparison. After redundant write elimination, PCM cells with respect to lower order bits of pixels are written more frequently than those corresponding to higher order. Based on this observation, we show that the lifetime can be further improved either by wear leveling using periodical data reversion to make write traffic even across PCM cells or by application-level error tolerance evaluation without leveling. Experimental results demonstrate that with the proposed techniques,
the lifetime of PCM-based image buffer can be improved significantly.

Index Terms—Error tolerance, phase change memory (PCM), wear leveling, write traffic reduction.

Memory Controller logic

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