

SSDPlayer: It's Not Where Your Data Is, It's How It Got There

Project in Concurrent and Distributed Systems 236371¹

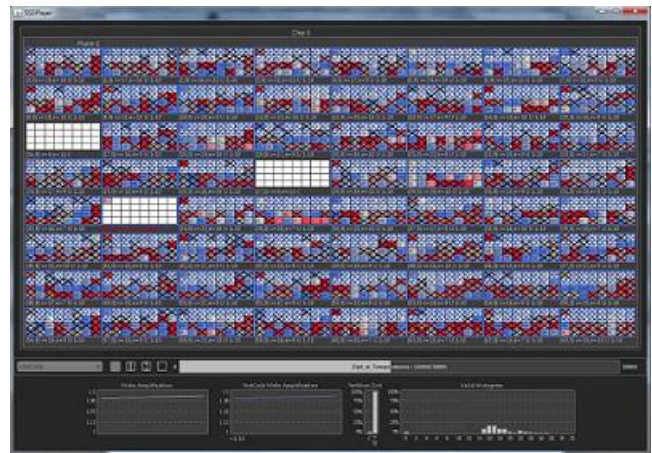
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NAND flash based Solid State Drives (SSDs) are used to replace hard disk drives in many large scale, mission critical storage systems, due to their fast read latency. However, they may suffer long write response times due to their physical properties. In addition, flash memories exhibit complex error patterns that depend on the flash organization, management and use. Many algorithms were suggested to improve the management of data on the flash media to improve SSD performance and error handling.

This project is based on [SSDPlayer](#): a visualization tool which enables system designers to view how the layout of data on the flash media progresses over time according to the implemented management policy. The goal of this project is to enhance the tool with additional capabilities, so that more complex policies and behaviors can be visualized and analyzed.

Examples:

- Bit errors and failures
- Advanced coding techniques
- Optimized RAID configurations
- Garbage collection policies
- Advanced analysis tools



Requirements:

Part I

This is a self-learning project. The students will review the basic literature to understand the relevant concepts and characteristics of (1) NAND Flash storage, (2) the specific area of interest for the required enhancement, and (3) the existing tool documentation.

Part II

The students will implement a predefined set of features (from the examples above or others) on top of the existing tool, and demonstrate its contribution to analysis of relevant research.

Prerequisites:

- Operating systems course.
- Experience with Java programming.
- The project is designed for a group of 1 or 2 students.

¹ Also available as Project in Operating Systems (236366)