

PENNSYLVANIA STATE UNIVERSITY



Erie

The Behrend
College

FINAL REPORTS FOR STUDENT PROJECTS

SAM AND IRENE BLACK SCHOOL OF BUSINESS

Please note that names in parenthesis are faculty research collaborators.

Economics

Economics

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Economics

PROJECT TITLE: Studying Audio Protocols and Developing a Software System for Recording, Playback, and Signal Monitoring

STUDENT RESEARCHER AND SCHOOL: Matthew L. Baker, School of Engineering

AFFILIATED FACULTY MEMBER: Dr. Wen-Li Wang, Assistant Professor of Electrical and Computer Engineering

ABSTRACT:

The primary focus of this project was to study two different audio protocols: WAV and MP3, and develop an application for WAV playback, recording, and signal monitoring. The signal monitoring employs the array data structure to store the normalized audio samples that are displayed graphically to help examine and understand the audio waveform. The array data structure not only facilitates the playback at a random location, but also eases the identification of the current playback location, so a moving indicator bar can be drawn to let users visualize the real time playback progress. To yield normalized audio samples, the main variables to be considered are the sample size in bits and the number of channels. A high sample size can result in better fidelity but different sample sizes will have to further consider different data representations. For example, for 16-bit audio one needs to further deal with it being either a big or a little Endian layout in the channels, while 8-bit audio does not.

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