Bio

My name is Rohit Muralidharan and I am currently an undergraduate student studying Computer Science here at Berkeley. I am interested in distributed systems and their increasing relevancy. I hope to get out of this class a deeper understanding of the broad applications and practice of parallel programming and how to extend to a myriad of different fields, both in the industry and out of it.

Audio Compression

I was particularly interested in the applications of parallel programming in the practice of audio compression, a process widely used to compress audio files for transfer in order to save on cost of size.

Researchers are attempting to parallelize this process in hope of increasing speed while maintaining the relative accuracy of the original compression algorithm. This would in theory allow higher performance without an increase in error.

They attempted to solve this by segmenting the audio and attempting to compress each part in parallel. However, this approach did not fare well as standard audio compression follows a recurrence relationship and relies on previous input in order to generate the compression at a point in time. Thus, this attempt was deemed unsuccessful. Instead, this problem was attempted again by isolating certain processes of the algorithm and determining the most expensive, time-wise. From there, they were able to separate it and dedicate more threads to it in hope of load balancing the problem.

With this new solution, they were able to test it and found it made a slight difference in the performance of the application. They were able to scale the new application to larger problems but they found their results were only showing a slight improvement from the status quo. The biggest bottleneck that was revealed was the causal nature of the MP3 compression algorithm, rendering it difficult to parallelize.