

# MA 1600 – Media Compression Project

## Suggested Resources

To get you started, you might want to look at the following resources. You \*will\* want to enhance this list by searching for additional material.

- “Insights through Computing” gives some good introduction to manipulating images and audio files. I recommend picking one media form to work with: manipulating images (Section 12.4), manipulating audio (Section 13.1). You should be able to embed either form of media in a Microsoft document for your final report.
- Ben’s write up on the continuous/discrete cosine transform. [http://mathgeek.us/teaching/ma1600-2015-1/cosine\\_transform.pdf](http://mathgeek.us/teaching/ma1600-2015-1/cosine_transform.pdf).
- A set of slides from Purdue giving additional background to the cosine transform. <https://www.math.purdue.edu/academic/files/courses/2014fall/MA16021/FourierSeries%28nopauses%29.pdf>
- Youtube video demonstrating audio compression by keeping only certain DCT components <http://www.youtube.com/watch?v=Ko0Dk4uZK8o>

## Necessary Project Components

1. Implement a 1-D DCT algorithm for computing the discrete cosine transform of a signal, as well as a 1-D iDCT algorithm for reconstructing a signal from it’s coefficients.
2. Apply your 1-D DCT algorithm to an audio file, and generate and compare various compressed media files, created by only keeping a fraction of the original DCT coefficients. If you are working with images, convert your 2D image to a 1D vector using the Matlab command `resize`.
3. (Optional) If you have time, explore a 2-D approach to generating compressed images. Use the built-in MATLAB functions `dct2` for this portion of the project <http://www.mathworks.com/help/images/discrete-cosine-transform.html>.