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Random Signals Final Project Proposal: Multimedia Watermarks

**Background Information**

Our project is based on the article “Secure Spread Spectrum Watermarking for Multimedia” by I. Cox, J. Kilian, F. Leighton, and T. Shamoon. These researchers develop an algorithm for watermarking media such as music, videos, and pictures such that it cannot be seen (or heard). This is done by using a Gaussian random array of numbers. The array is inserted over the largest spectral components in the media. The watermark should be able to withstand operations on the data such as filtering, cropping, and compression to name a few.

**Proposed Project**

We propose to insert “secret” watermarks into audio and images using the method given in the paper described above. We will show that these watermarks are undetectable by listening to the audio or by viewing the image. We will show that we can extract a copy of the watermark after an image has undergone cropping, scaling, translation, and rotation. We will show that we can extract a copy of our watermark from an audio file after it has been compressed, filtered, re-recorded, or clipped. We will show how random signals concepts are used to insert and extract the watermarks. The signal processing and data collection will be done using Matlab. Other software may be used, for instance to re-record and audio file. We will demonstrate our project using a graphic user interface built in Matlab with commands to upload and display images or plots of audio data, to add a watermark to the media, and to detect a watermark in uploaded media.

This project shows how watermarking can be used to add additional information in an audio file or in an image file. Watermarking is a way of adding copyright information, recipient information, or other information to media. This information may be used for things like checking media ownership and monitoring broadcasts.

**Progress Schedule**

We have created some milestones to help us achieve our project goal by the due date:

1. Set up git repository for Matlab code: October 9th
2. Read media using matlab and apply signal processing to media: October 16th
3. Watermark insertion and extraction algorithm implemented in Matlab and tested, GUI built: November 13th
4. Result reporting implementation: November 27th
5. Oral presentation finished: December 4th
6. Report submission: December 11th

**Reference**

http://www.musictrace.de/technologies/watermarking.en.htm

http://ieeexplore.ieee.org.ezproxy.lib.ou.edu/stamp/stamp.jsp?tp=&arnumber=650120