Math 77A, Project-2 (Due Dec. 3, 2010)

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Instruction: you may turn in the project electronically to us with results and MATLAB programs attached.

I. (a) Let $A = [1, 0.9; -0.8, 1]$, and mix two speech utterances $S(t) = (s_1(t), s_2(t))'$ by $X(t) = AS(t)$. Load sound files with wavread. Use ‘soundsc’ to play out the two components of $X$, and compare with those of $S$.

(b) Recover $A$ and source signals by the second order decorrelation method with time shift. Evaluate the separation result by hearing.

(c) Let $\tilde{A}$ be the recovered $A$, compute $\tilde{A}^{-1}A$, what matrix structure appears?

(d) Plot and visualize $(s_1(t), s_2(t))$, $(X_1(t), X_2(t))$, and recovered source signals in (b).