CO6062: Machine Learning Algorithms, CE/NCU, 2023

Homework 2, Due: 2023/12/18 (Tuesday)

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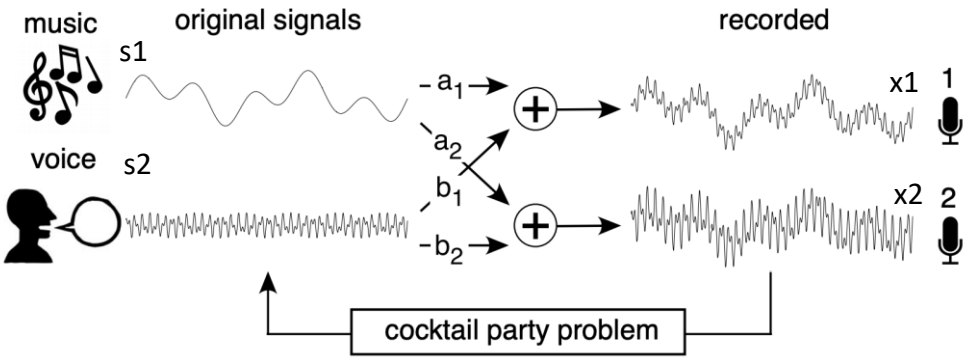
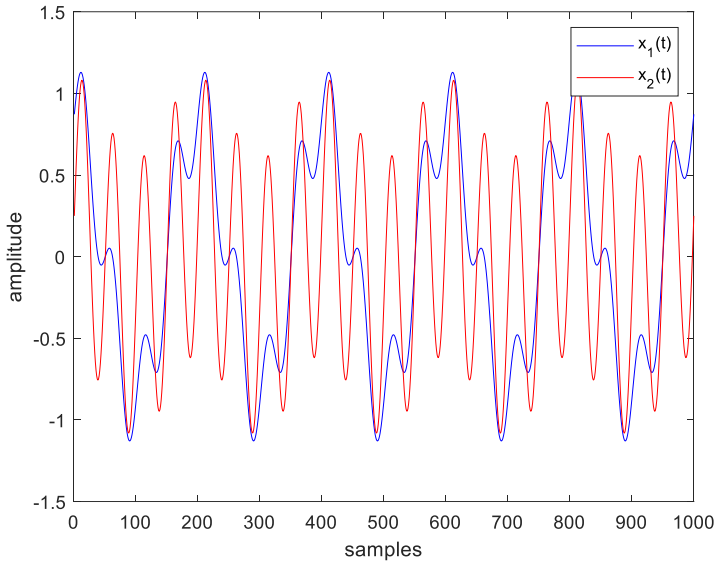
Problem: Consider a Cocktail Party problem as plotted in the following figure.



Two sound sources s1 and s2 are generated by music and voice, recorded as x1 and x2 simultaneously from two different microphones in a linear summation of unique weights a_1, a_2, b_1 and b_2. The goal of the cocktail party problem is to recover the original sources solely using the microphone recordings. A classical method is to use the Independent Component Analysis (ICA) algorithm. Suppose we have recorded x1 and x2 (the given ZIP file: **X.zip**) as:



Study the ICA method and write a MATLAB program to recover s1 and s2 from the recoding file **X.zip**.

References:

1. Jonathon Shlens, A Tutorial on Independent Component Analysis, 2014. (arXiv:1404.1986)
2. Aapo Hyvarinen and Erkki Oja, Independent Component Analysis: A Tutorial, 1999.