

Advanced Comm. Theory Class Tutorial 4

November 29, 2021

1 Aims

1. To implement AIC and MDL for detecting the number of co-channel sources/Txs using an antenna array.

2 Data files

Data file “Ex04_Array_Signal_Snapshots.mat” should be downloaded from ACT Classes Files.

3 Exercise: Detection problem

Consider a uniform circular array (UCA) formed by $N = 6$ omnidirectional antennas which operates in the presence of M co-channel signals. The provided file “Ex04_Array_Signal_Snapshots.mat” include $L = 1000$ snapshots of the array received signal $\underline{x}(t) \in \mathcal{C}^{N \times 1}$, i.e. $\underline{x}(t_1), \underline{x}(t_2), \dots, \underline{x}(t_L)$. Detect the number of sources M using

1. AIC
2. MDL

4 Submission

Submission via OneNote Class Exercise. No later than Sunday 12th December.

5 Marking

Each tutorial submission will be marked as “Pass” or “Fail”: Pass = 1 mark; Fail = 0 mark.