

Uppsala University
Department of Information Technology
Division of Systems and Control

Homework Assignment no. 5

SPATIAL METHODS

Deadline: October 15

This fifth homework is based on **Exercise C6.14**.

For your convenience, code for the different spectral estimators can be downloaded at <http://www.prenhall.com/stoica>. Make sure that you use these functions correctly, (use “`help`”. If still in doubt how to use the functions, try by inspecting the code directly.) Here follow some explanations and clarifications for the corresponding parts of **Exercise C6.14**:

Note that there are several typos in Exercise C6.14 in the textbook (see the errata).

Use the four spatial estimators: Beamforming, Capon, MUSIC and ESPRIT and try to locate the submarine(s) by estimating the(ir) direction(s) of arrival (DOA) with each method. Plot the results overlaid in the same figure to make the comparison easier. What conclusions can be drawn from your results? Describe the differences between the four methods and explain the advantages and drawbacks with each technique.