Gap based Analysis of Subspace Identification Method
Associate Professor Kenji Ikeda

Faculty of Science and Technology
Tokushima University

<図表>

N=1024

N=2048

N=4096

N=8192

N=16384

N=32768
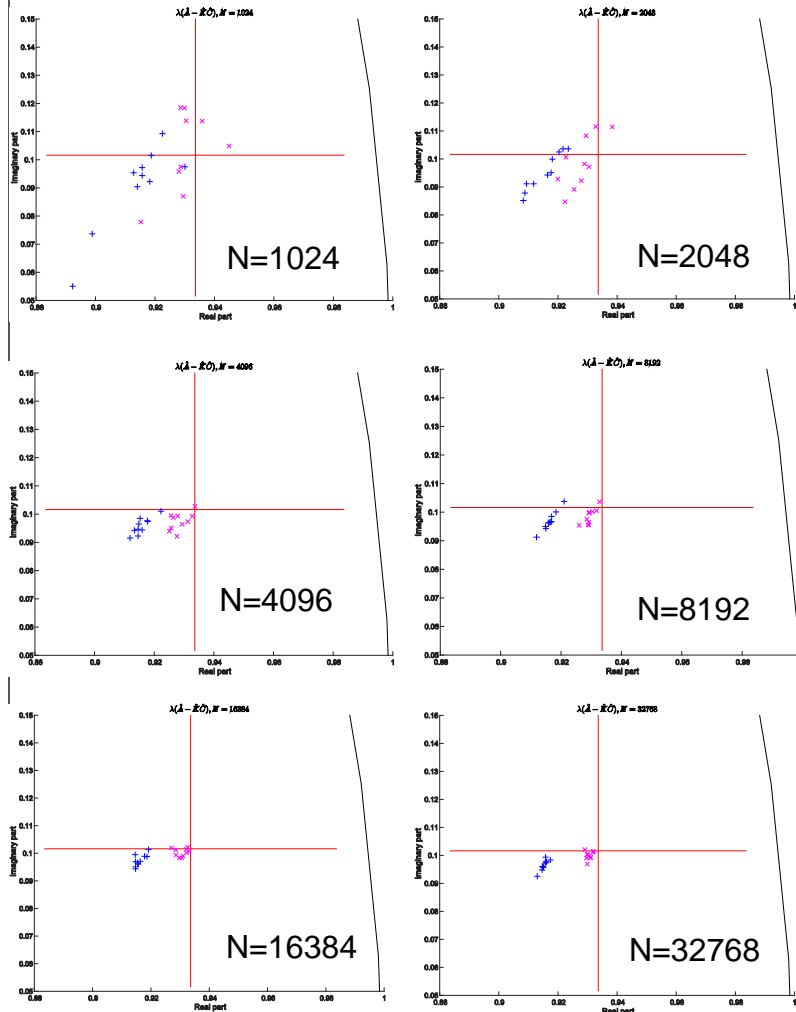
Content:

  Control engineering is a highly developed fundamental discipline of the engineering, in which systematic design methods of control systems are developed based on the optimization by using mathematical models of the plant. System identification is one of fields in the control engineering which estimates the plant model systematically from input/output data of the plant. Subspace identification is a comparatively new method and has attracted attention from the middle of the 1990s. However, we have to say its analysis on the mathematical characteristics such as the variance of the estimate are not sufficient.

  We have proposed a variance analysis method based on the gap between the singular subspaces spanned by some data matrix which enables us to compare several subspace methods and determine optimal design parameters, etc.

  We are now proposing consistent estimates of Kalman gain and the covariance matrix of the innovations process. Only asymptotically consistent estimates of them are proposed in the conventional methods. So, more accurate variance of the estimates will be evaluated.