

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

ELECTRICAL ENGINEERING DEPARTMENT

COMPUTER PROJECT 6, EE 556 (051)

For the system given in Computer Project # 1, develop a Particle Swarm Optimization (PSO) program to design an intelligent power system stabilizer (PSOPSS) using $\Delta\omega$ as the control input. Choose an eigenvalue-based objective function. With your program, investigate the followings: -

- a. Effect of the initial value of the inertia weight (Try 0.8, 1.0, 1.2, ...). Set the decreasing factor at 0.99.
- b. Effect of the number of intervals (Try 5, 10, and 20).
- c. Find the optimal design of PSOPSS
- d. Carry out the eigenvalue analysis of the system with PSOPSS. Compare with the classical PSS.
- e. Carry out the time-domain simulations for 5 seconds with a 10% pulse input of mechanical torque from 1.0s to 1.1s. Compare the simulation results without PSS and with the classical PSS.

Assume any missing data you may need.

Submission:

Write a formal report that includes the eigenvalue analysis and simulation results. A hardcopy of the program developed must be attached. A softcopy of all materials (report and program) must be e-mailed to mabido@kfupm.edu.sa. All materials are due on December 30, 2007.