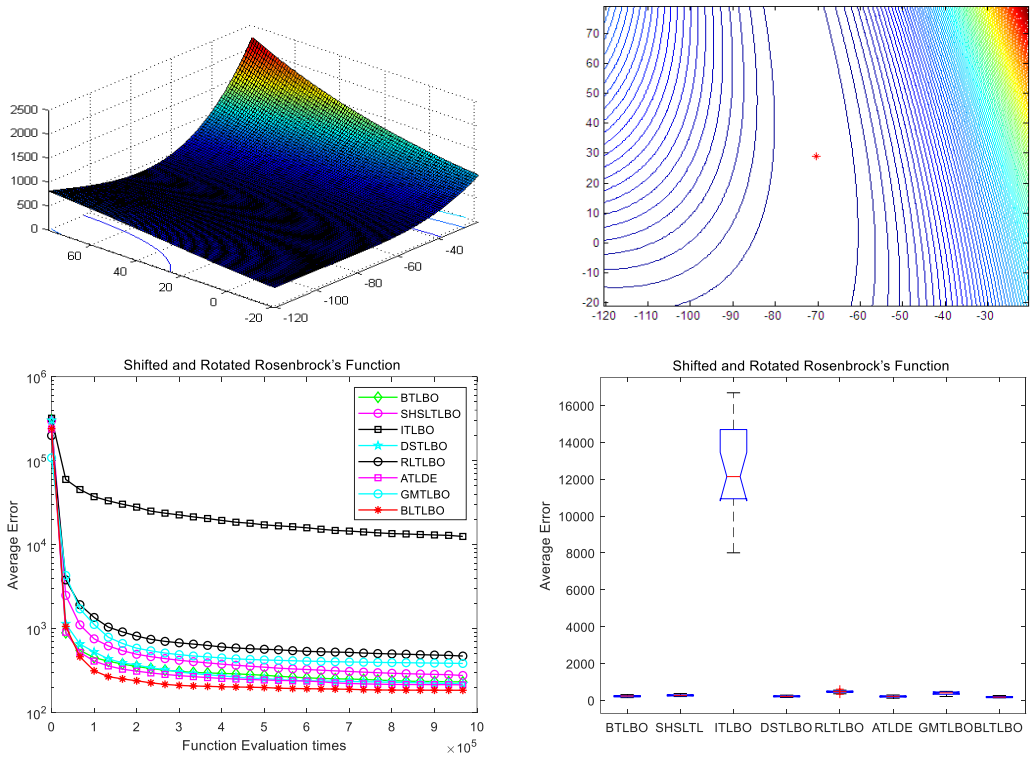
Supplementary Materials: Convergence curve and distribution box plot of test function on different dimensions

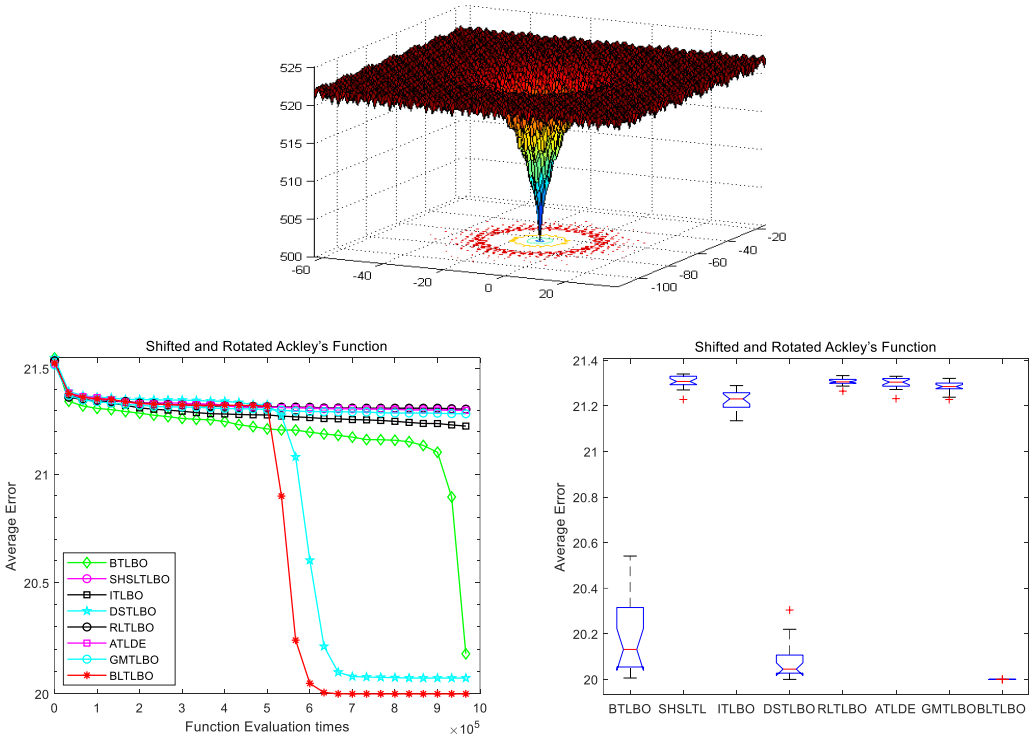
(Note: The code for the BTLBO 、CSO、 DECCG、ATLDE and RLTLBO algorithms is from the original authors)

F_1: Shifted and Rotated Rosen brock's Function



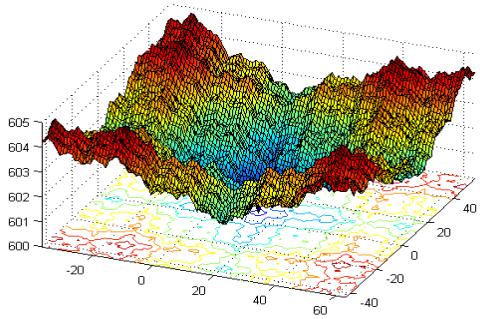
Convergence curve and distribution box plot D =100

F_2: Shifted and Rotated Ackley's Function

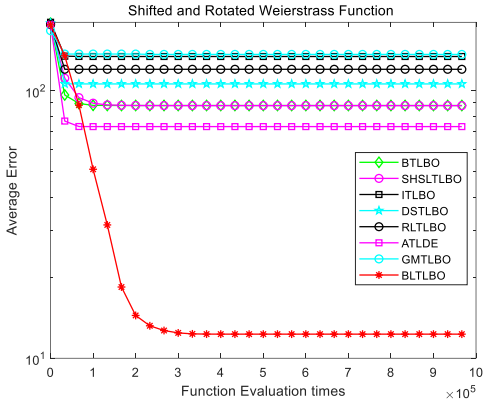


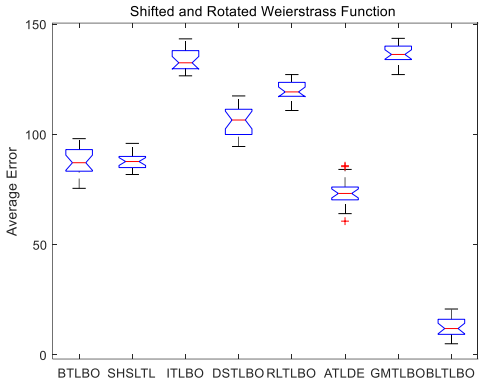
Convergence curve and distribution box plot D = 100

F_3 : Shifted and Rotated Weierstrass Function



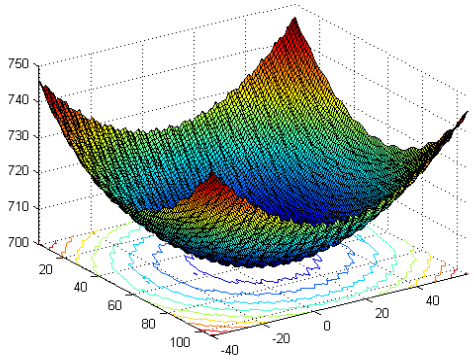
Convergence curve and distribution box plot D =50

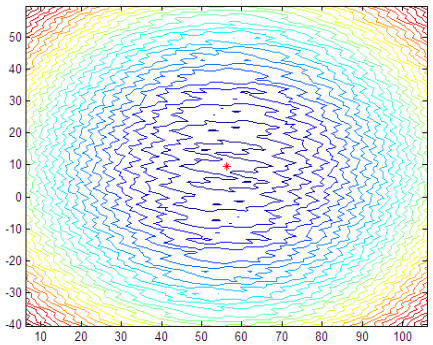


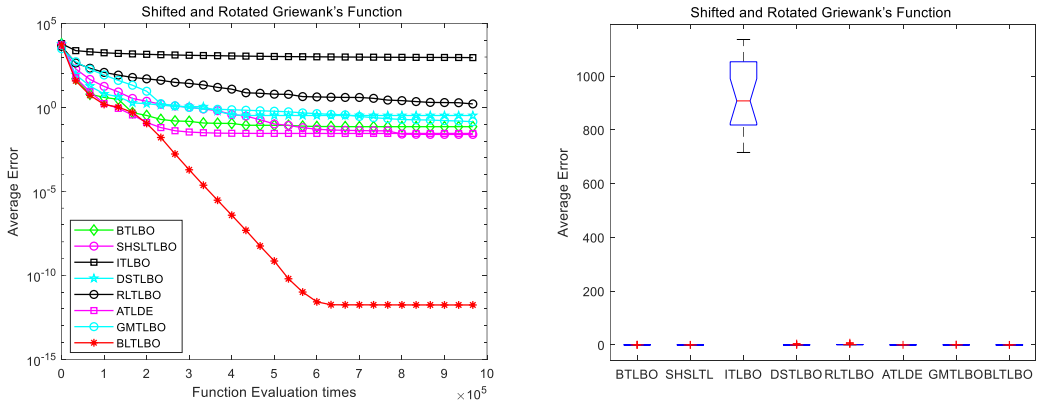


Convergence curve and distribution box plot D = 100

F_4: Shifted and Rotated Griewank's Function

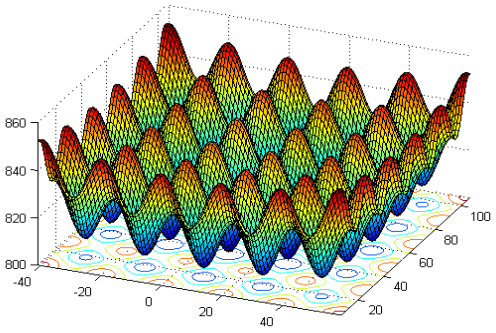


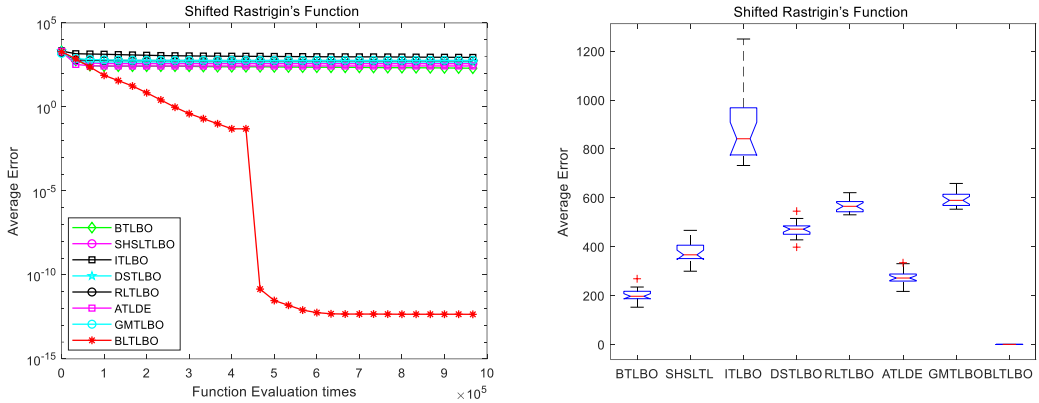




Convergence curve and distribution box plot D = 100

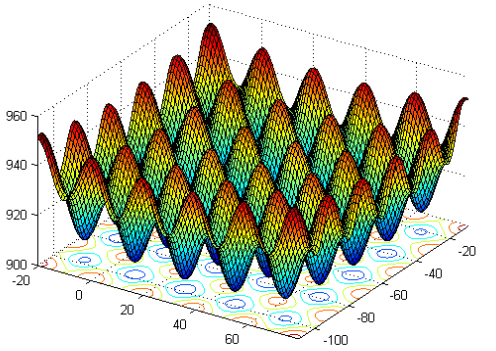
F_5: Shifted Rastrigin's Function

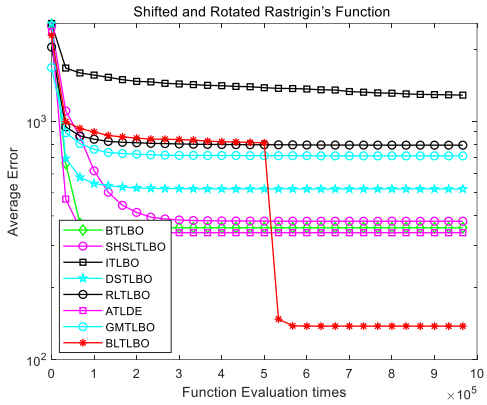


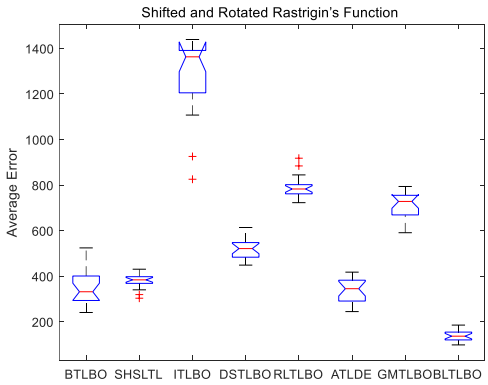


Convergence curve and distribution box plot D = 100

F_6: Shifted and Rotated Rastrigin's Function

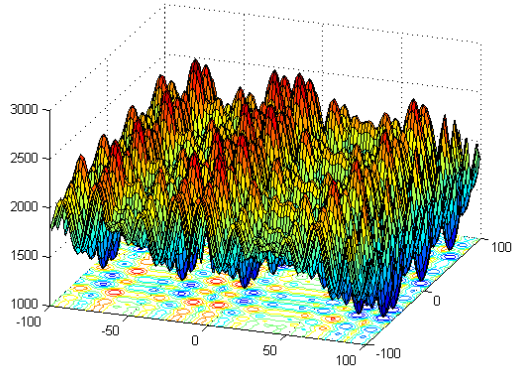


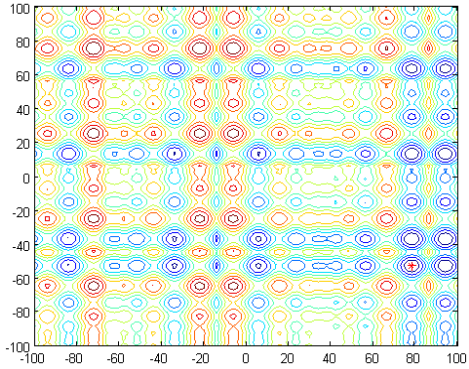


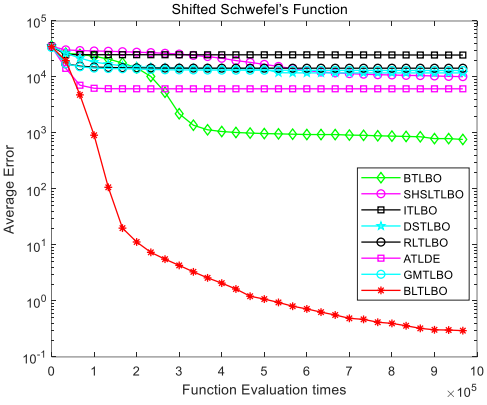


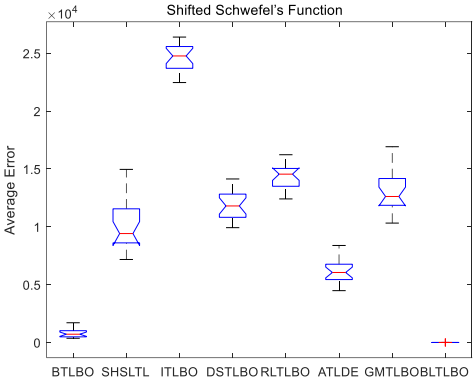
Convergence curve and distribution box plot D = 100

F_7: Shifted schwefel's Function



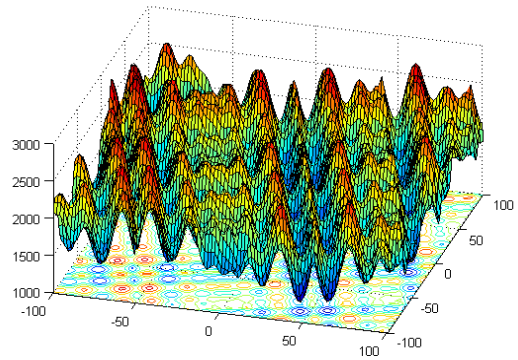


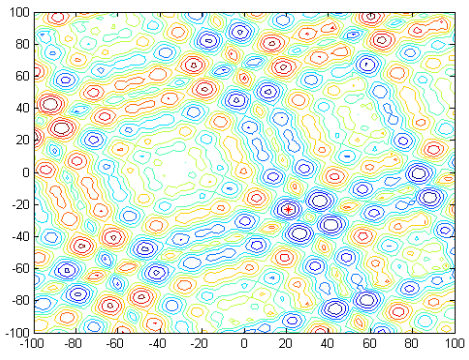


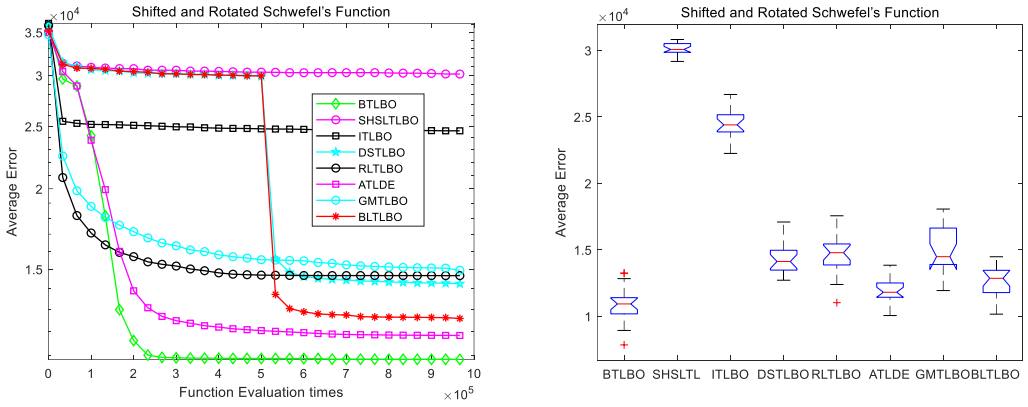


Convergence curve and distribution box plot D = 100

F_8: Shifted and Rotated Schwefel's Function

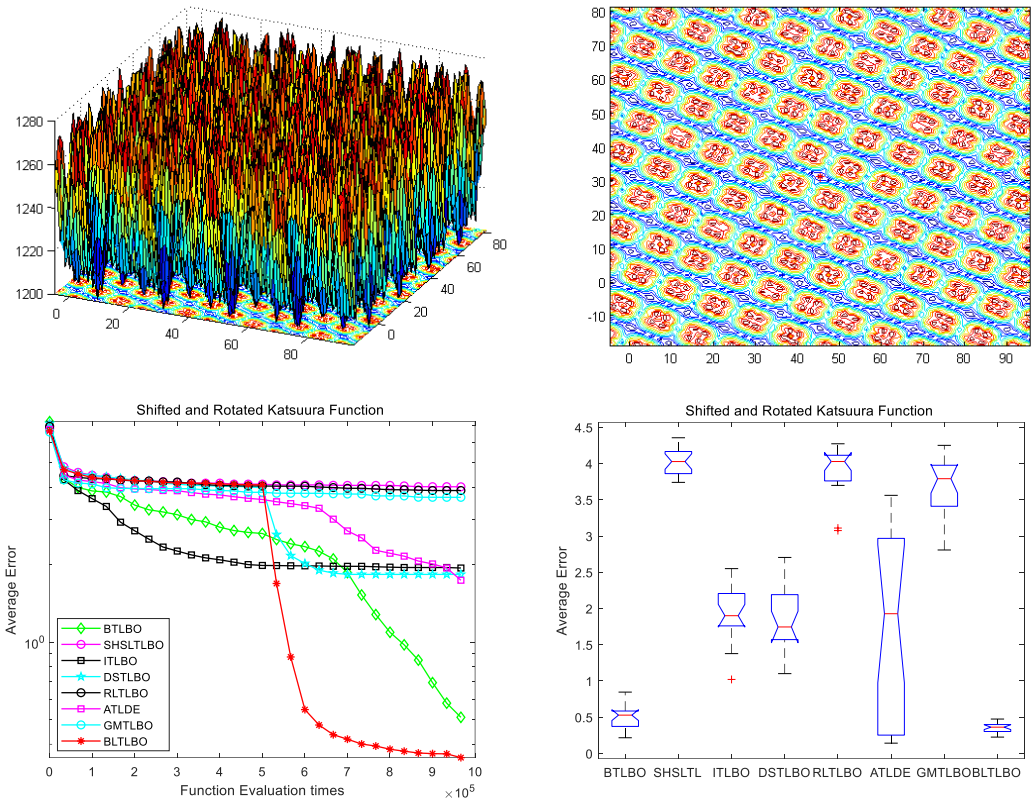






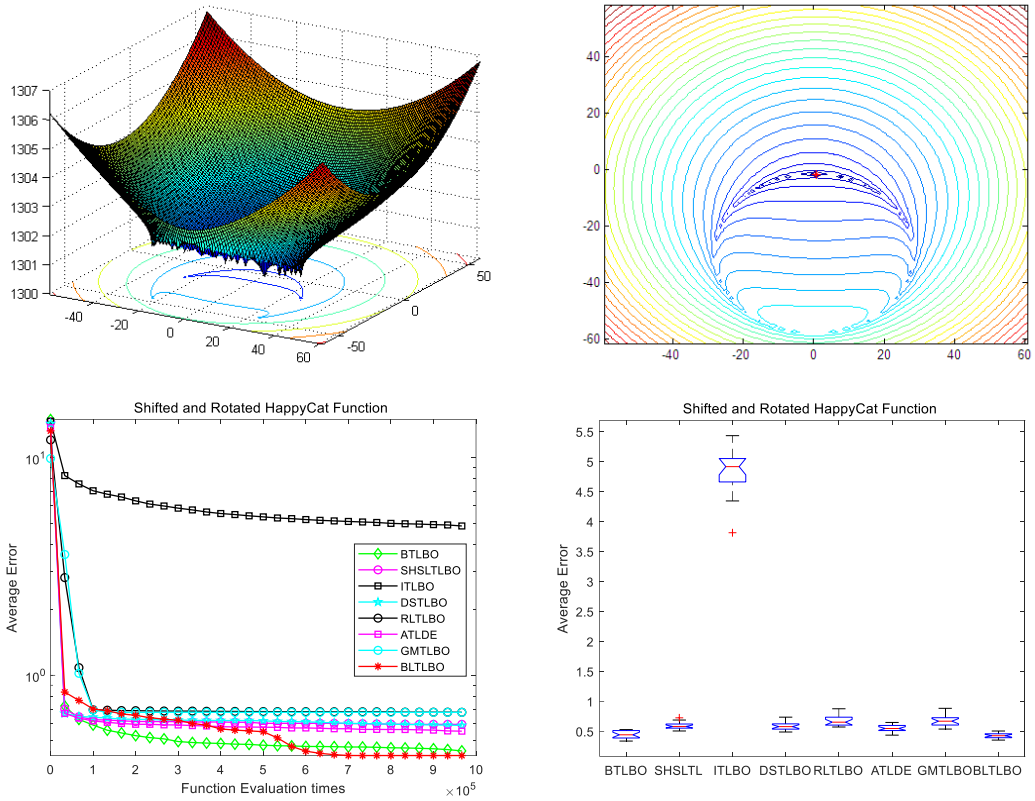
Convergence curve and distribution box plot $D = 100$

F_9: Shifted and Rotated Katsuura Function



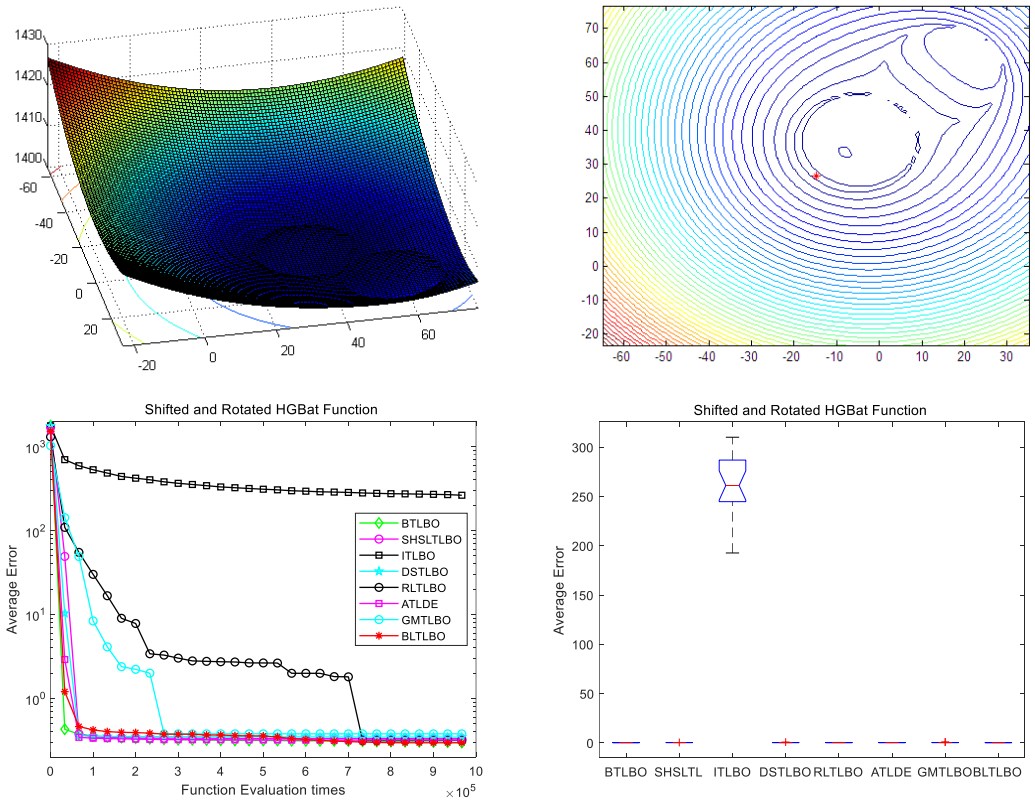
Convergence curve and distribution box plot $D = 100$

F_{10}: Shifted and Rotated HappyCat Function



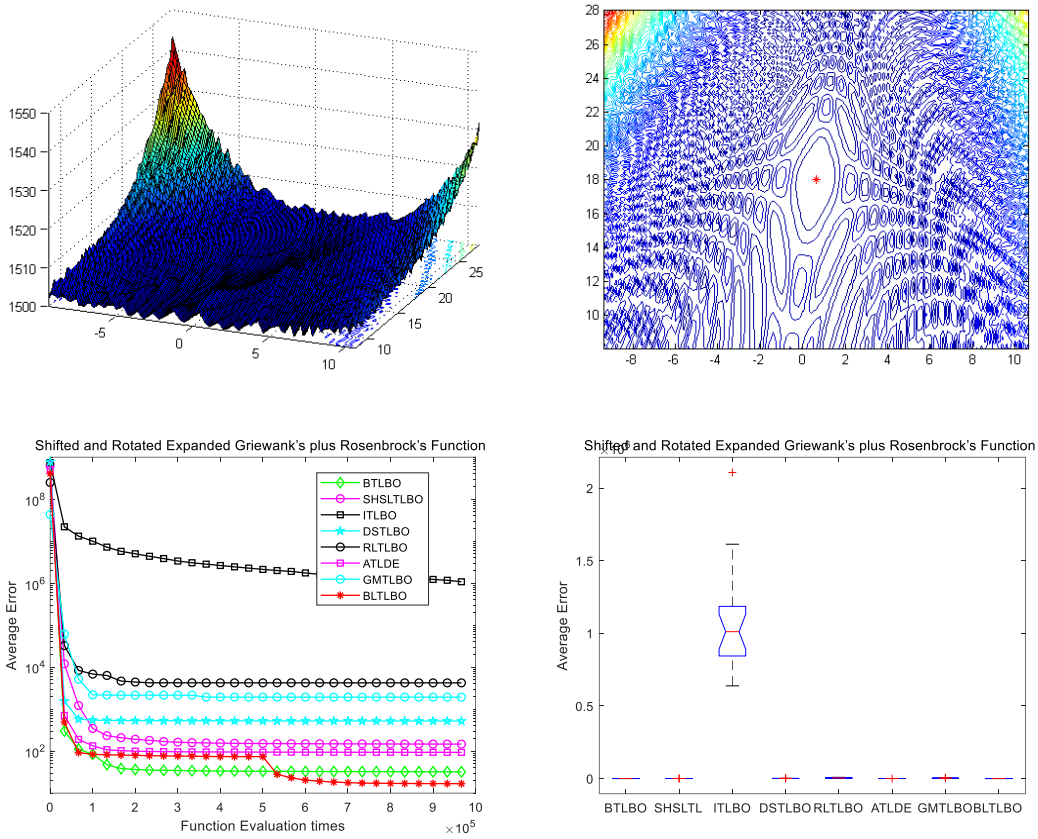
Convergence curve and distribution box plot D = 100

F_{11}: Shifted and Rotated HGBat Function



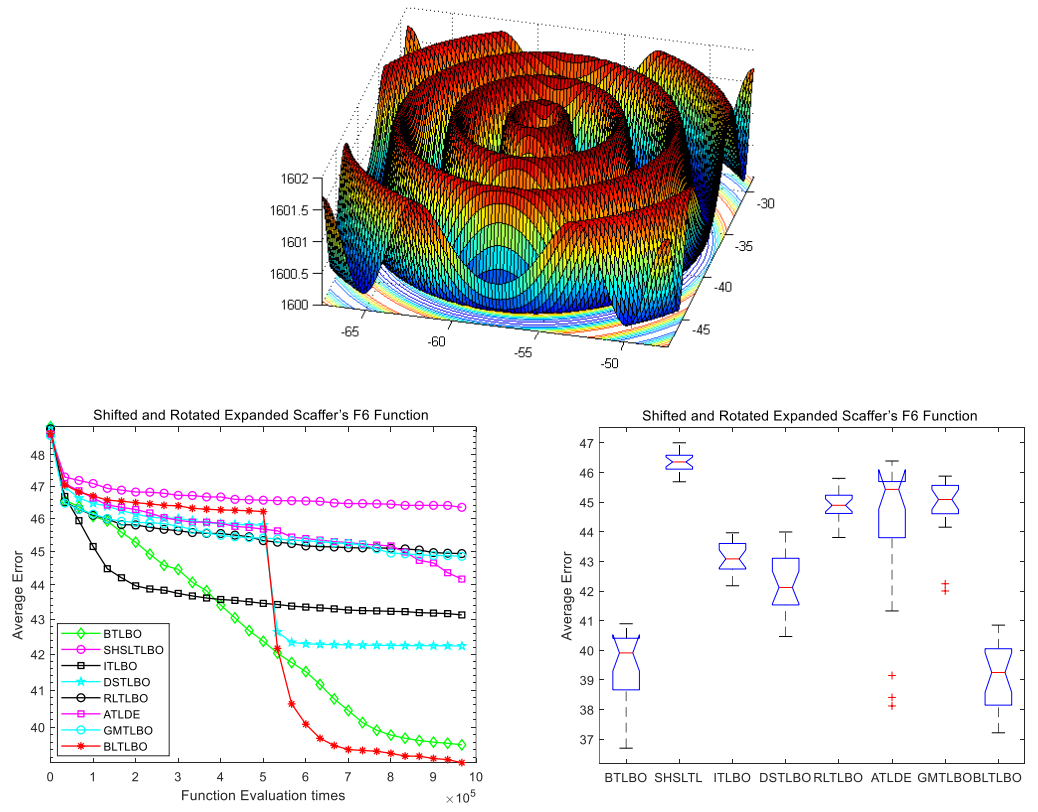
Convergence curve and distribution box plot D = 100

F_{12}: Shifted and Rotated Expanded Griewank's plus Rosen brock's Function



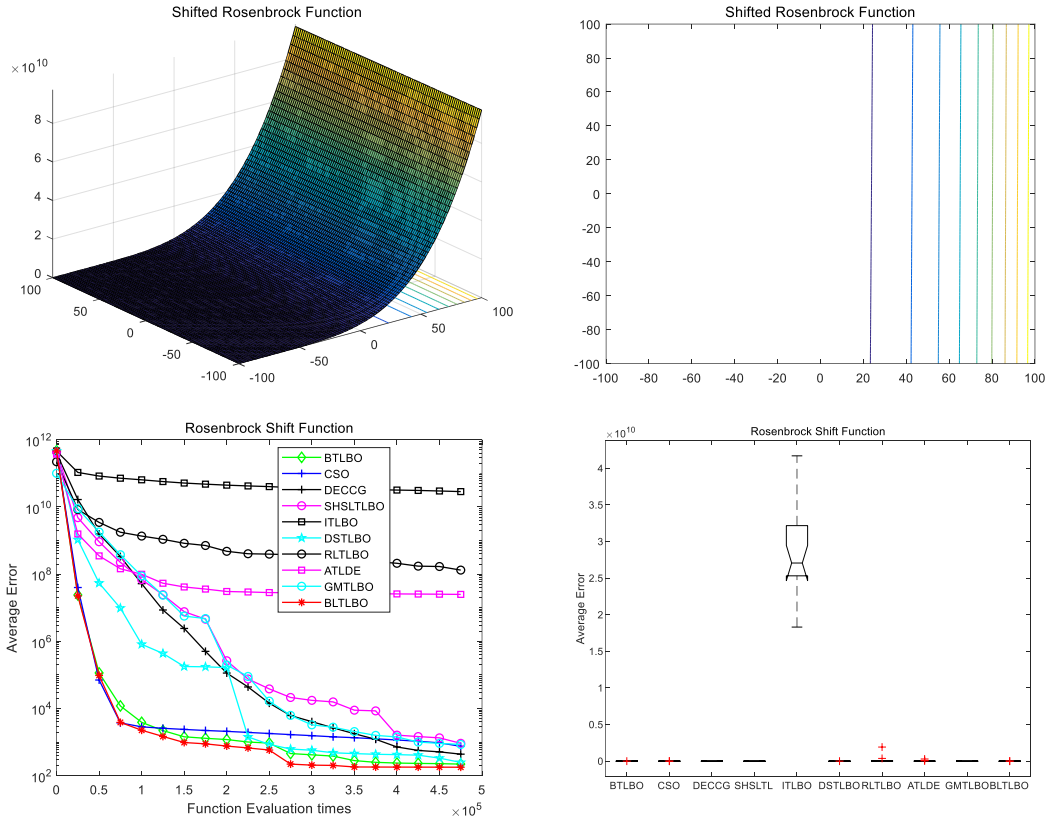
Convergence curve and distribution box plot D = 100

F_{13}: "Shifted and Rotated Expanded Scaffer's F6 Function"

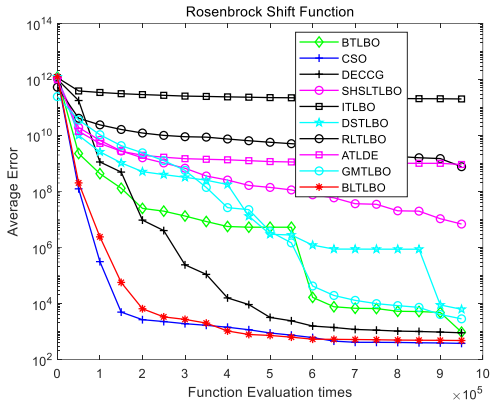


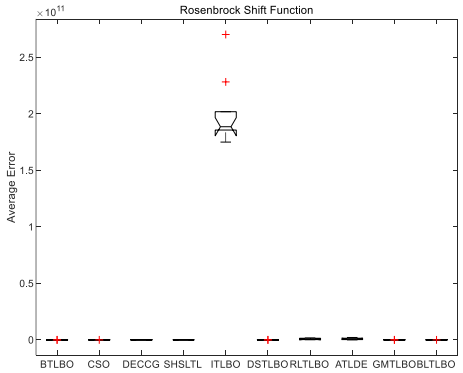
Convergence curve and distribution box plot D = 100

F_{14}: Shifted Rosen brock's Function

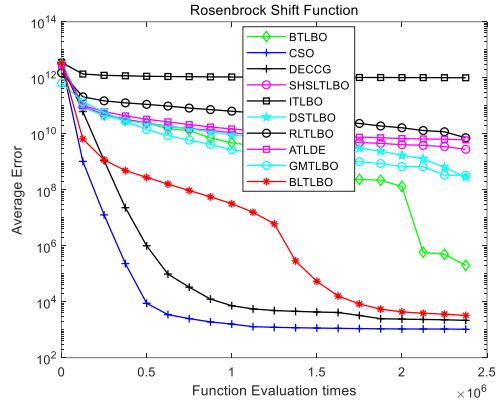


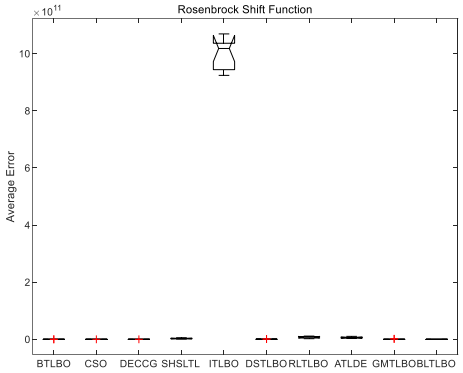
Convergence curve and distribution box plot D = 100





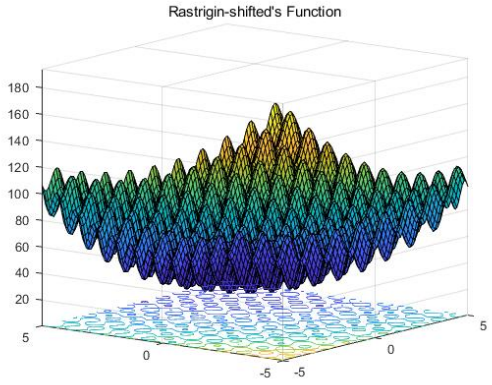
Convergence curve and distribution box plot D = 200

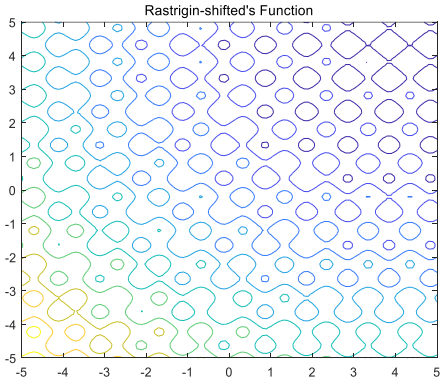


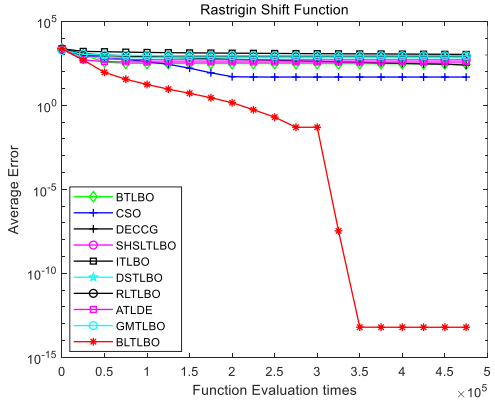


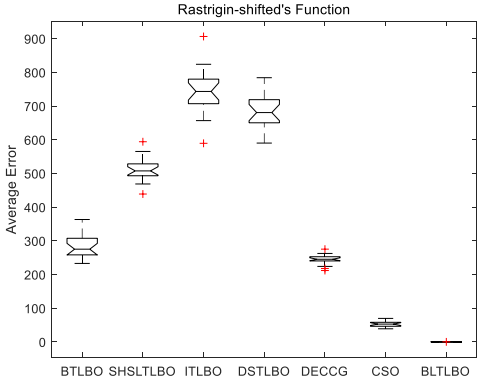
Convergence curve and distribution box plot D = 500

F_{15}: Rastrigin-shifted's Function

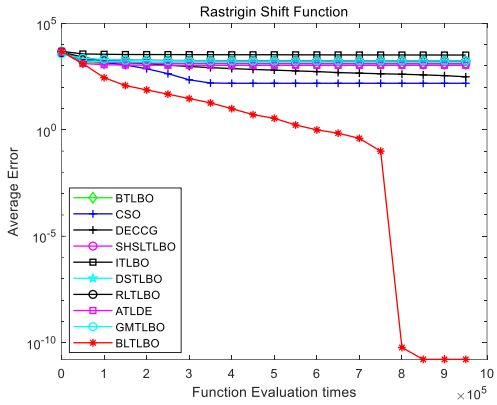


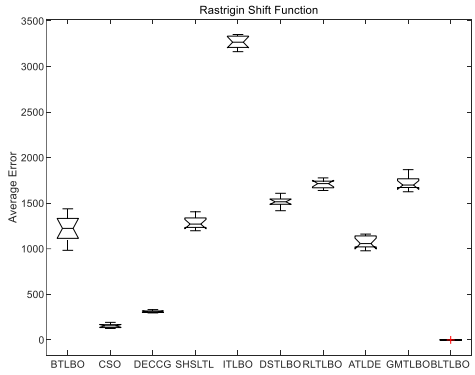




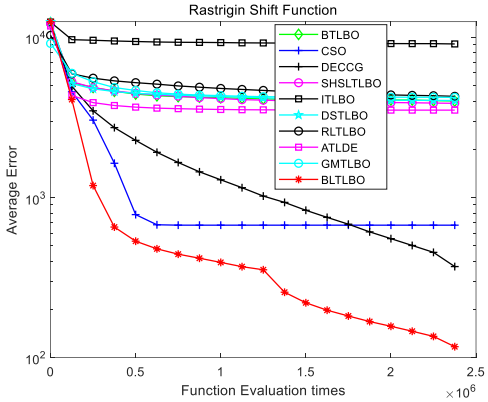


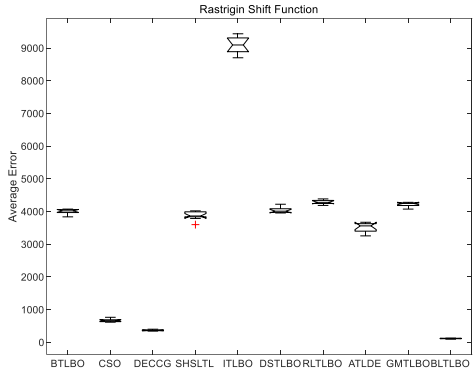
Convergence curve and distribution box plot D = 100





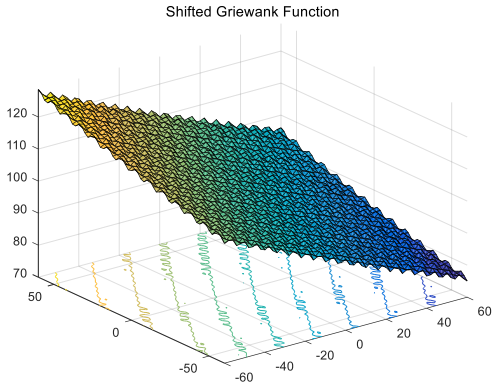
Convergence curve and distribution box plot D = 200

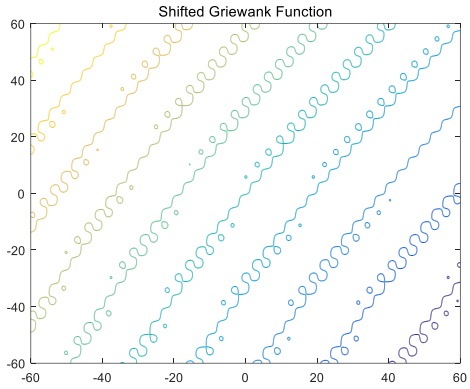


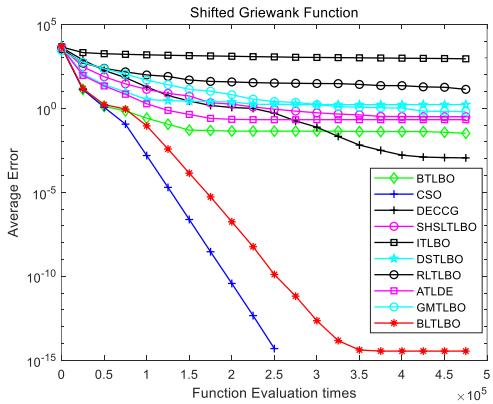


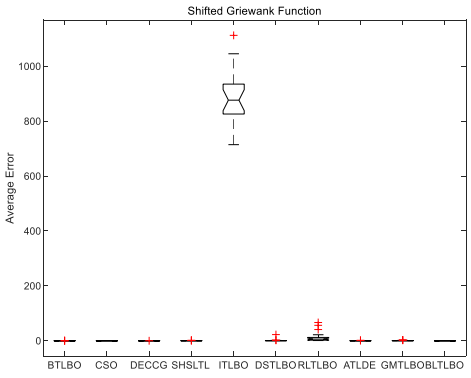
Convergence curve and distribution box plot D = 500

F_{16}: Shifted Griewank's Function

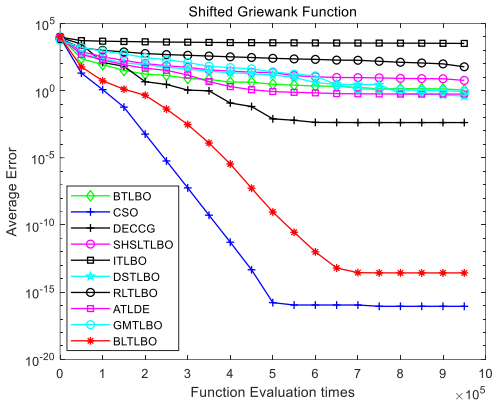


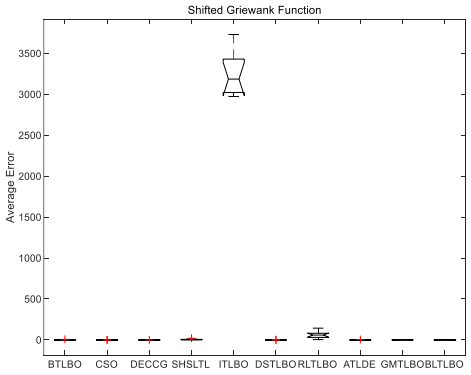




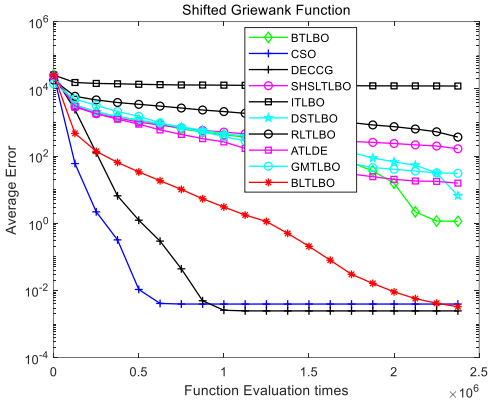


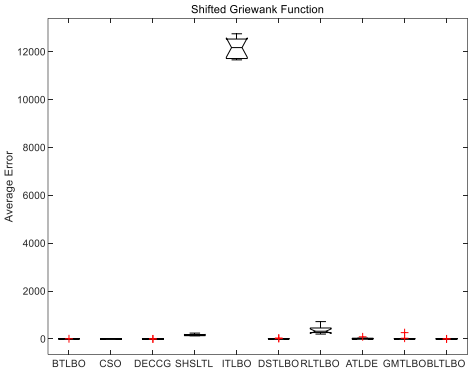
Convergence curve and distribution box plot D = 100





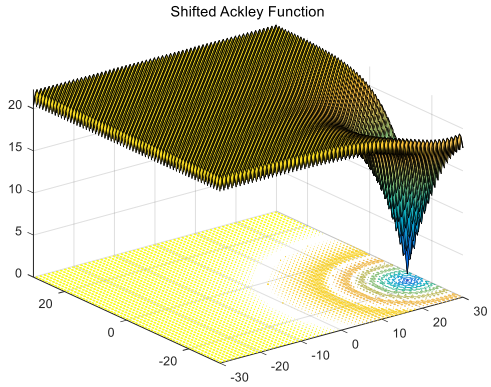
Convergence curve and distribution box plot D = 200

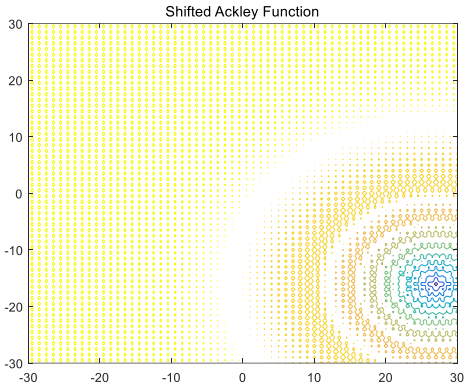


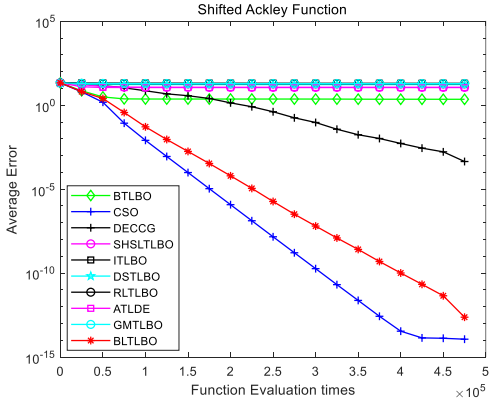


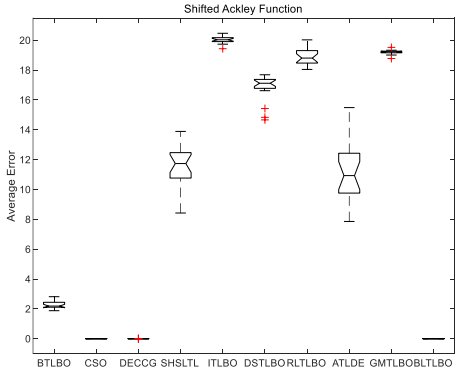
Convergence curve and distribution box plot D = 500

F_{17} Shifted Ackley's Function

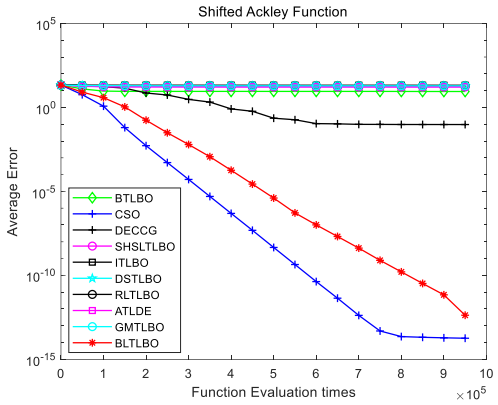


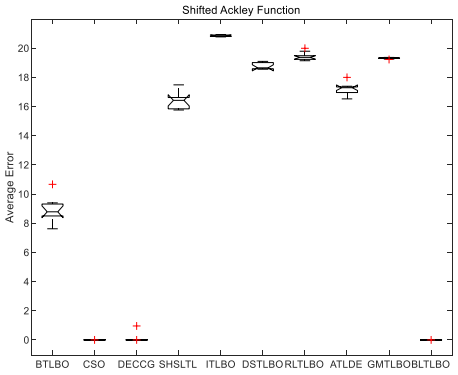




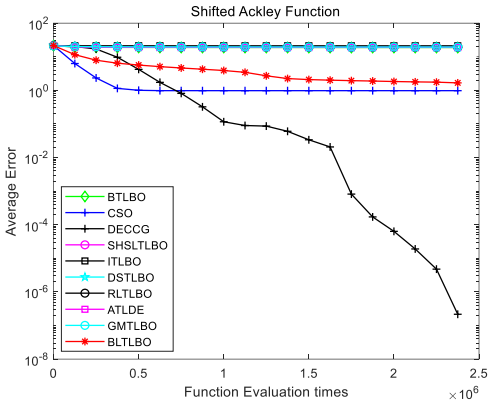


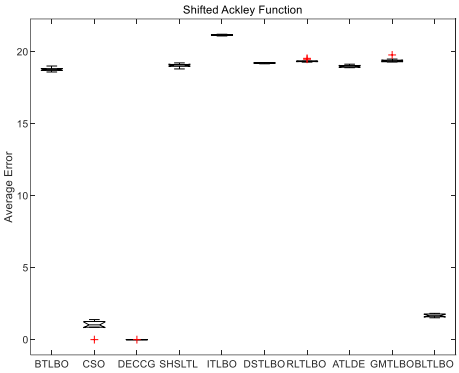
Convergence curve and distribution box plot D = 100





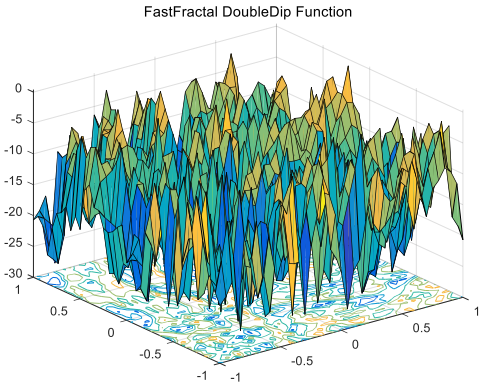
Convergence curve and distribution box plot D = 200

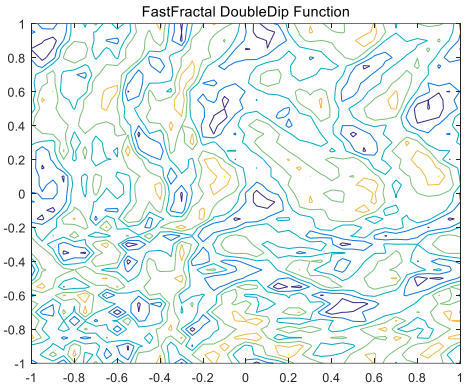


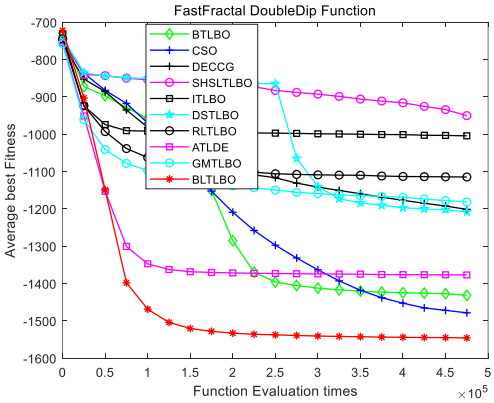


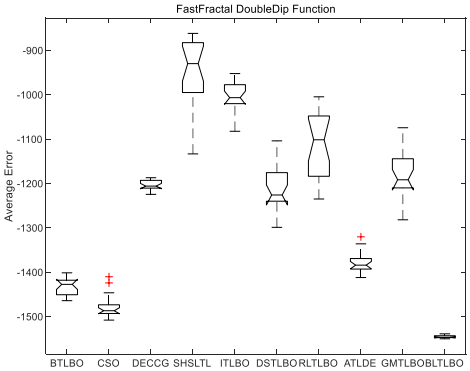
Convergence curve and distribution box plot D = 500

F_{18}:FastFractal “DoubleDip” Function

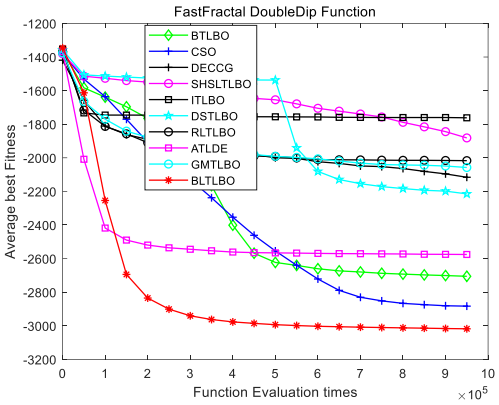


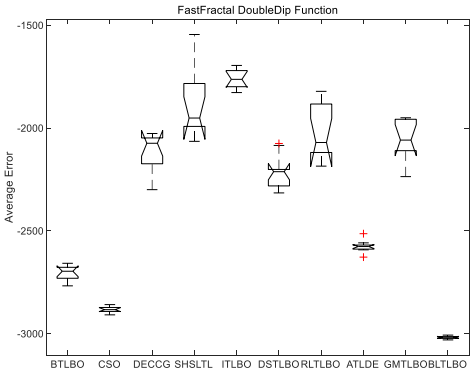




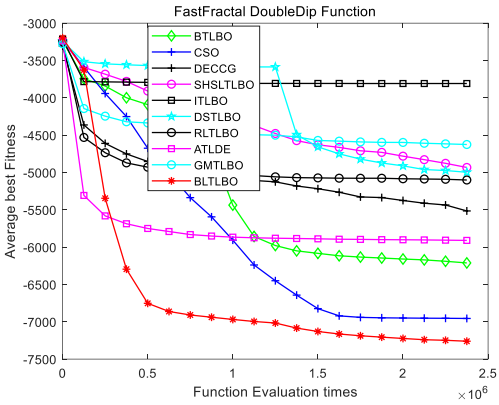


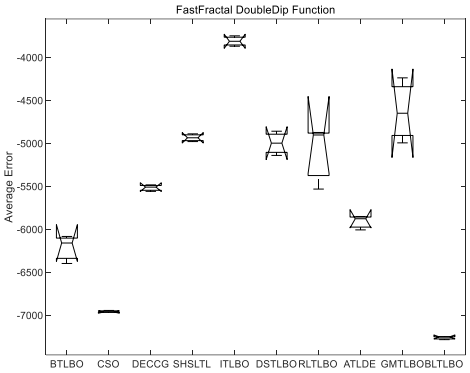
Convergence curve and distribution box plot D = 100





Convergence curve and distribution box plot D = 200





Convergence curve and distribution box plot D =500