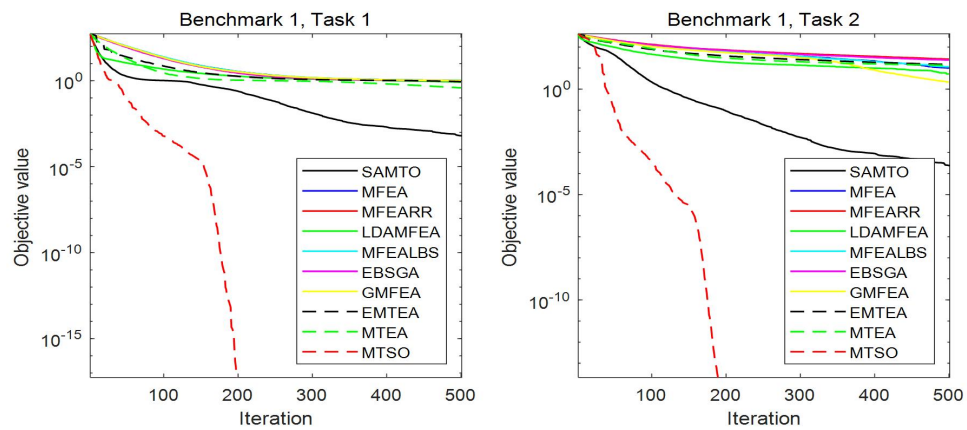
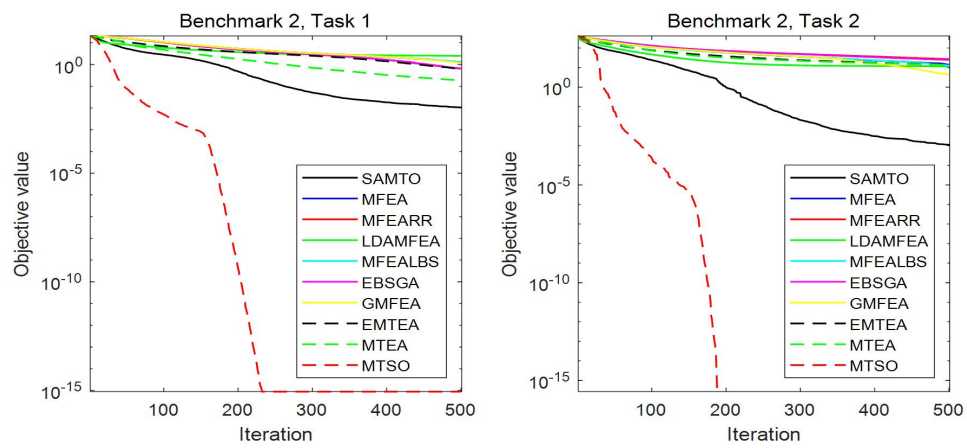


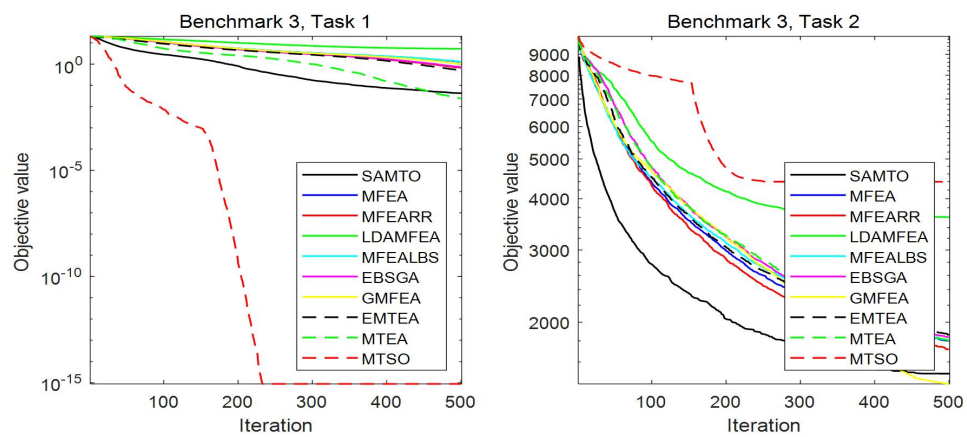
**Supplemental Figure S1** Convergence curve plots for 9 sets of multitask benchmark test functions



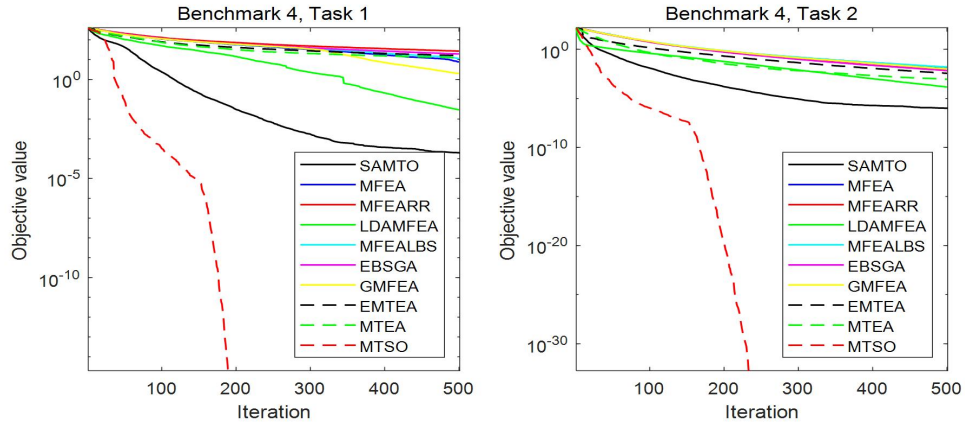
(a)



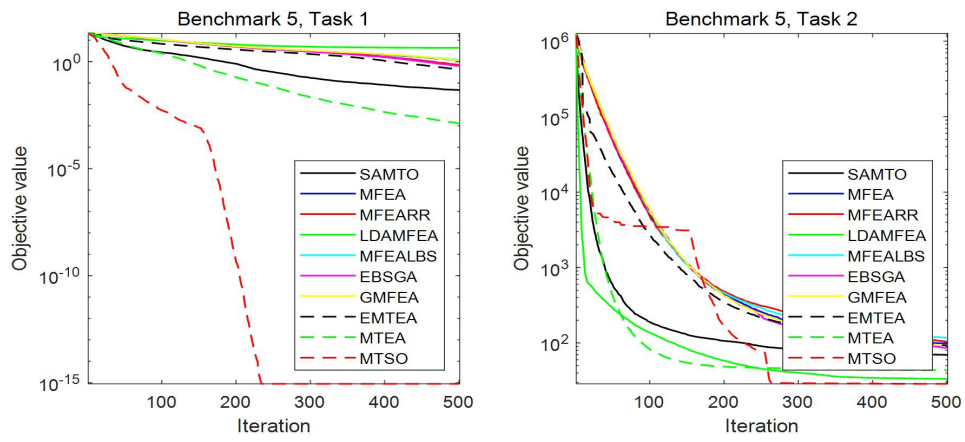
(b)



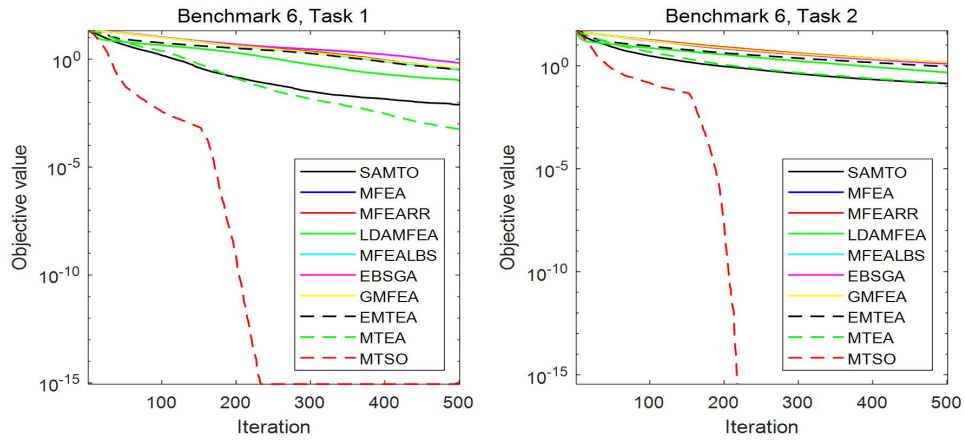
(c)



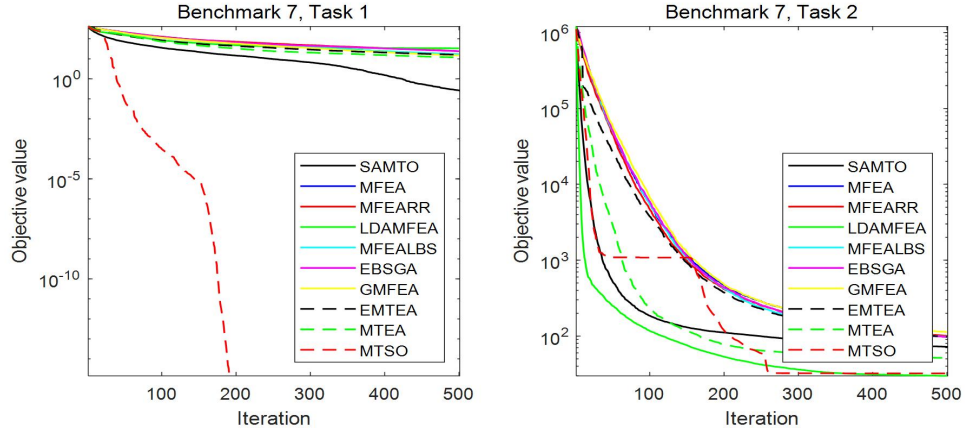
(d)



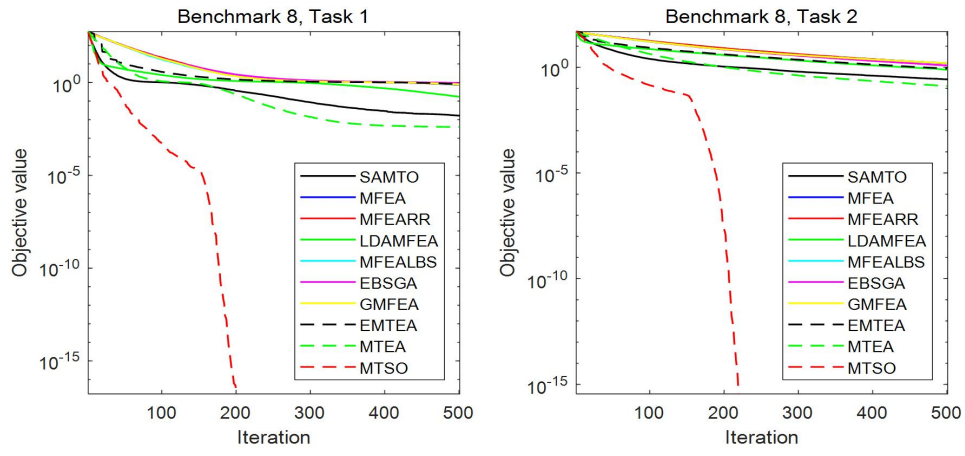
(e)



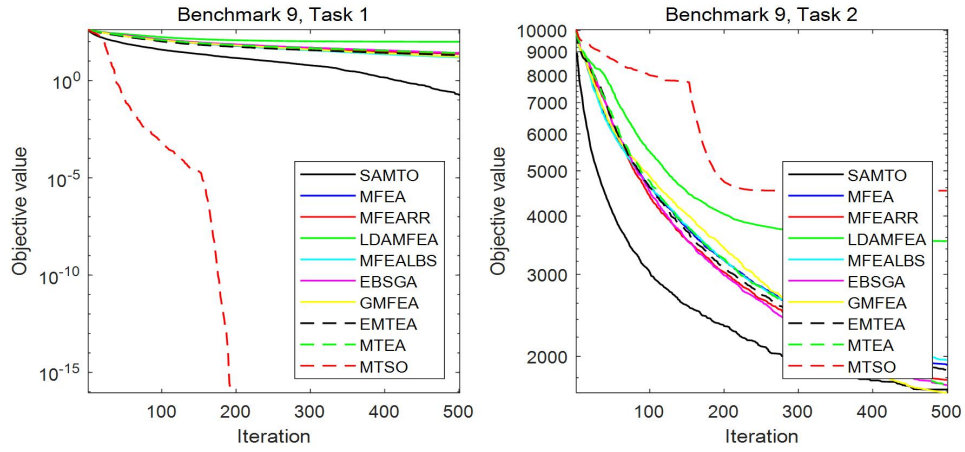
(f)



(g)

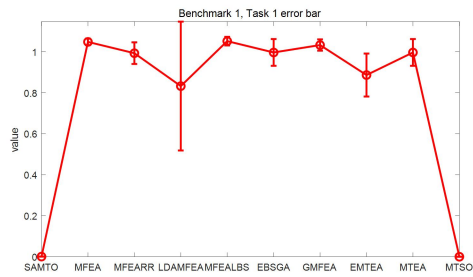


(h)

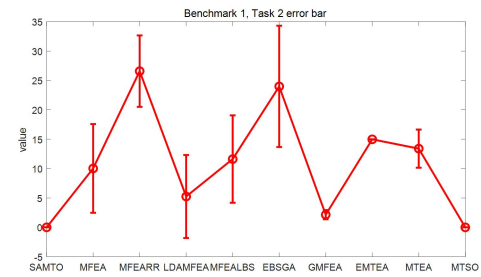


(i)

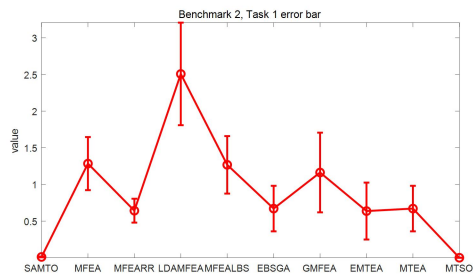
**Supplemental Figure S2** Error bars for 9 sets of multitask benchmark test functions



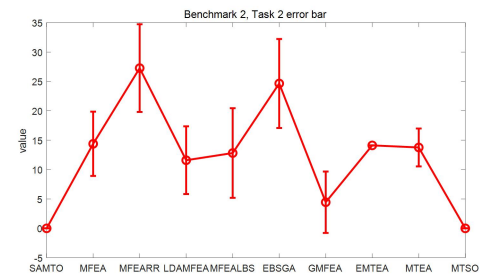
(1a)



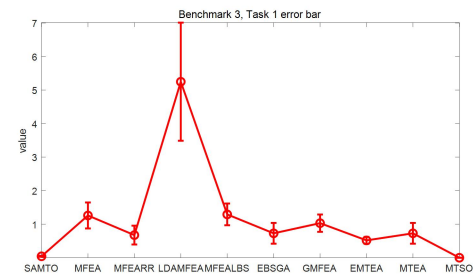
(1b)



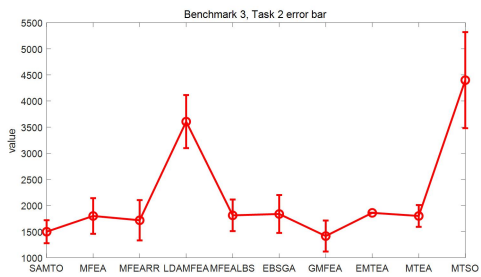
(2a)



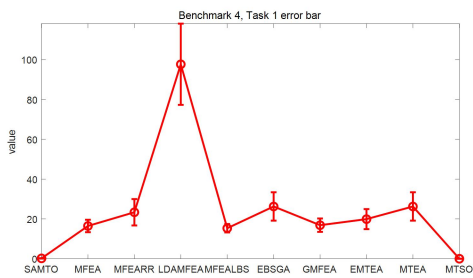
(2b)



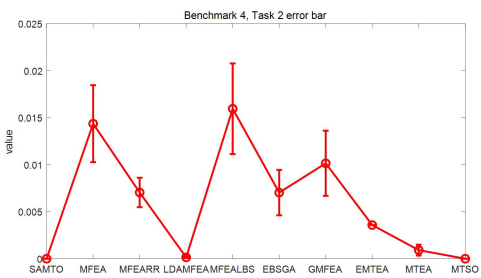
(3a)



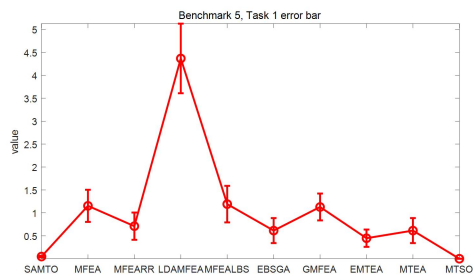
(3b)



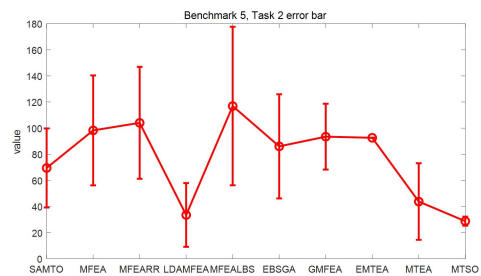
(4a)



(4b)

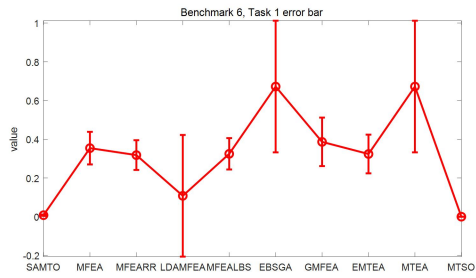


(5a)

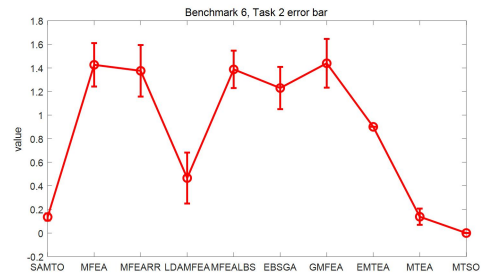


(5b)

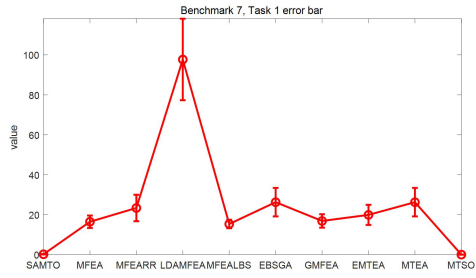




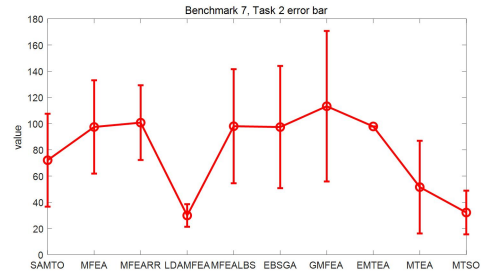
(6a)



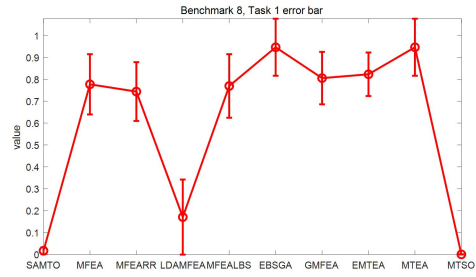
(6b)



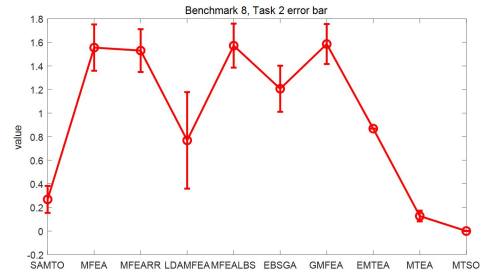
(7a)



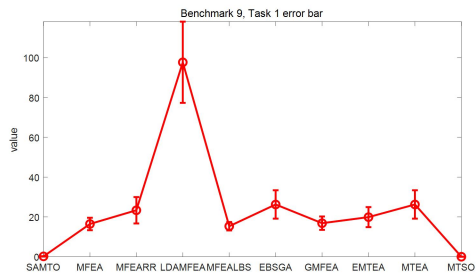
(7b)



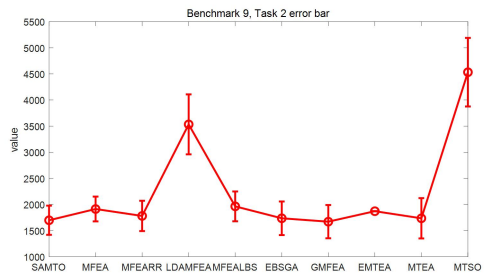
(8a)



(8b)

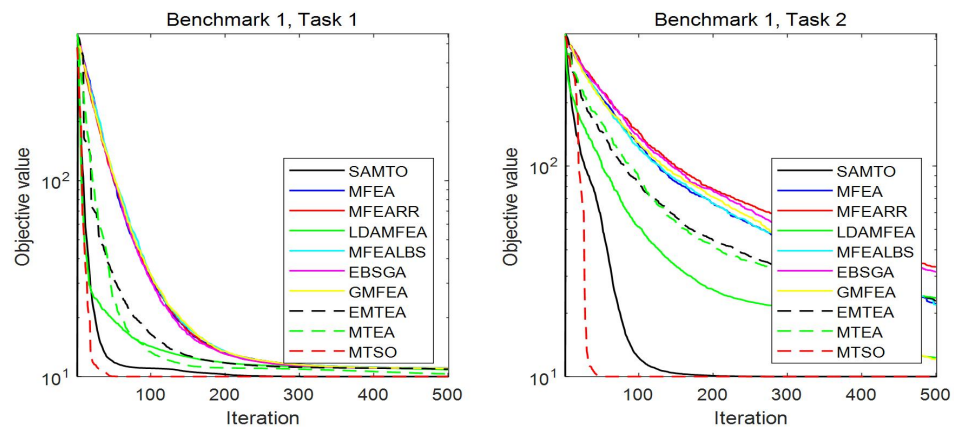


(9a)

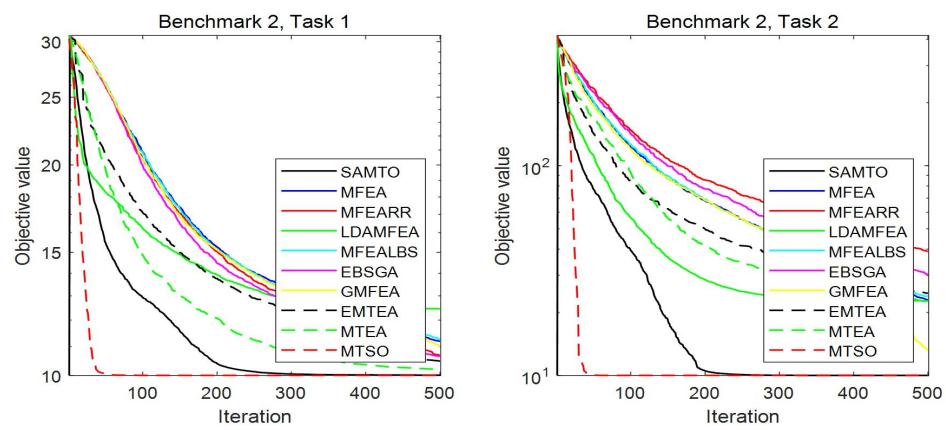


(9b)

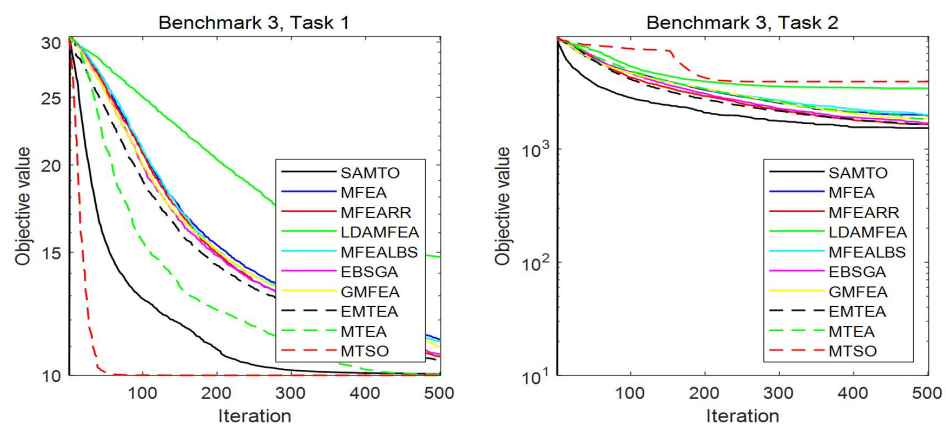
**Supplemental Figure S3** Noise Test Function Convergence curve plots for 9 sets of multitask benchmark test functions



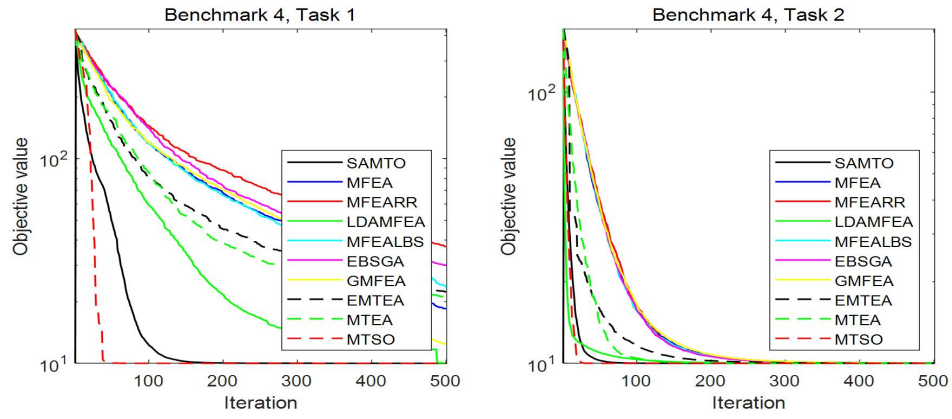
(a)



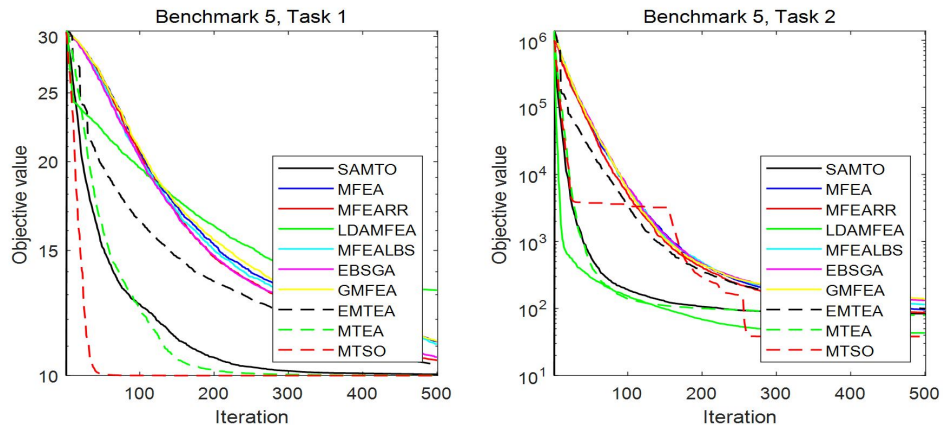
(b)



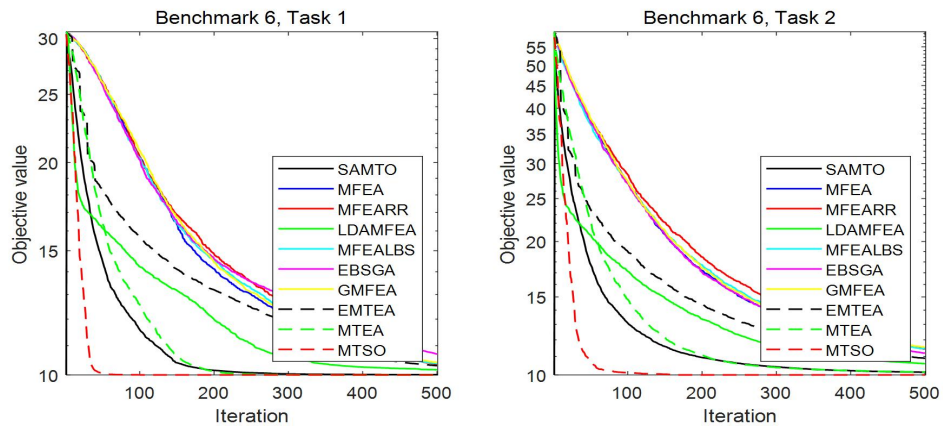
(c)



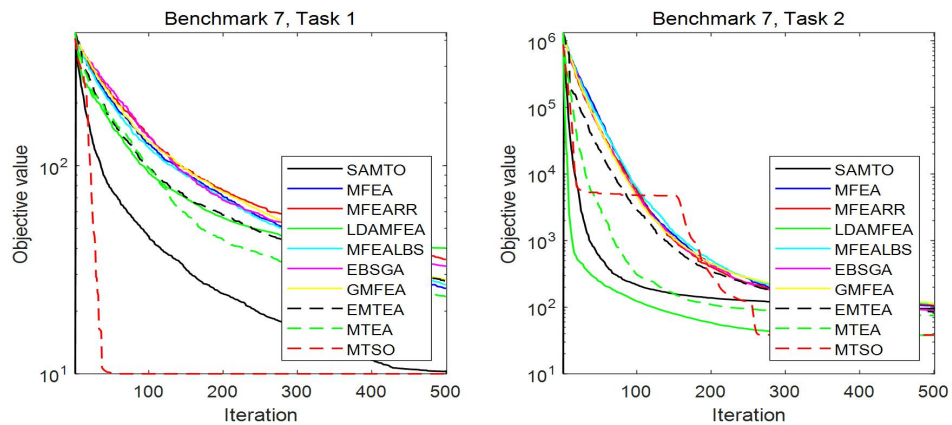
(d)



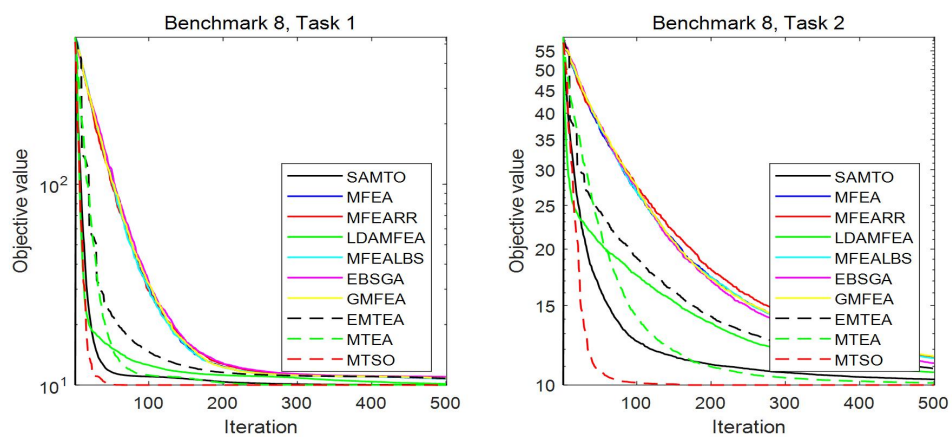
(e)



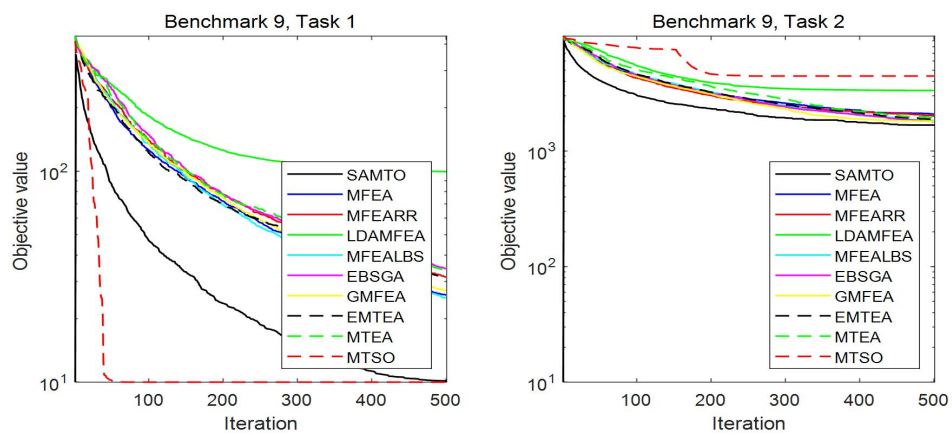
(f)



(g)

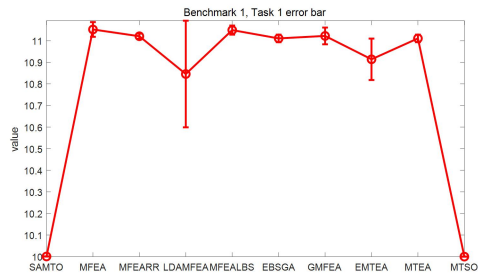


(h)

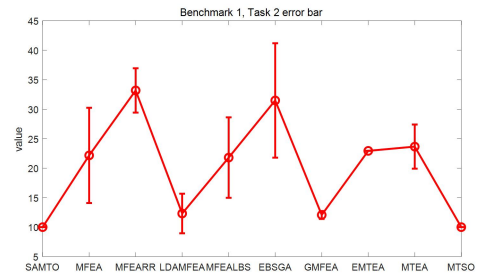


(i)

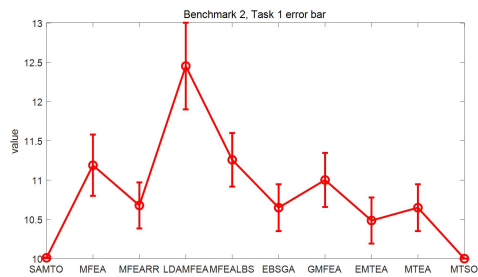
**Supplemental Figure S4** The error bar chart for the 9 sets of noisy multitask benchmark test functions



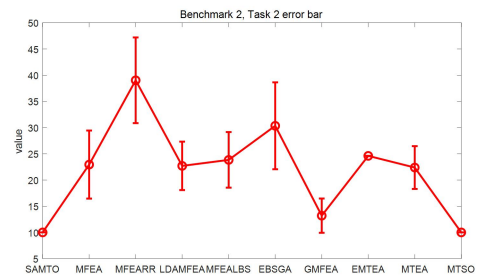
(1a)



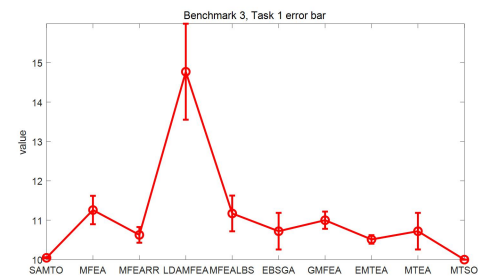
(1b)



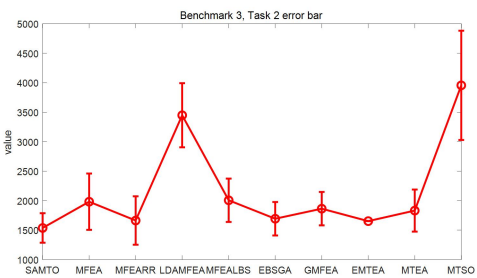
(2a)



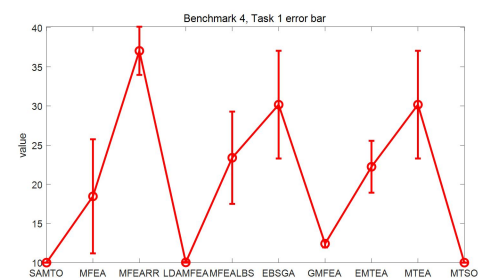
(2b)



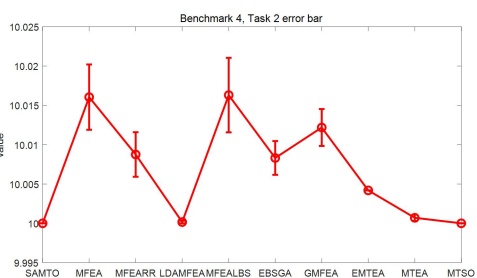
(3a)



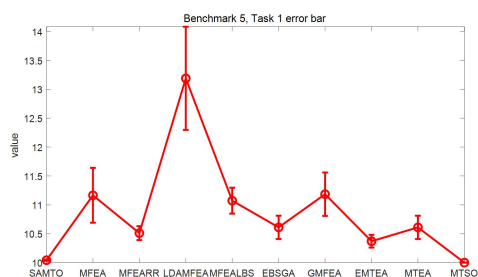
(3b)



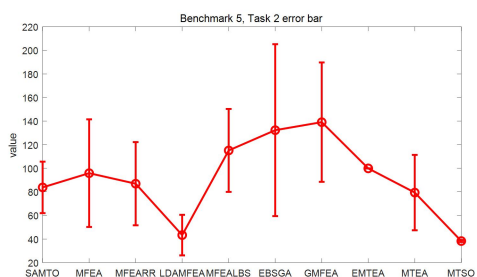
(4a)



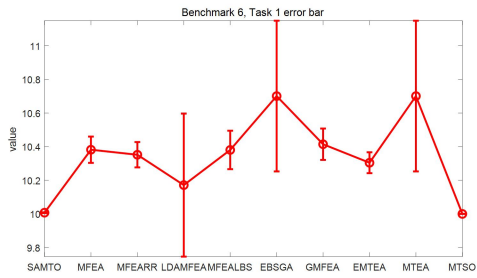
(4b)



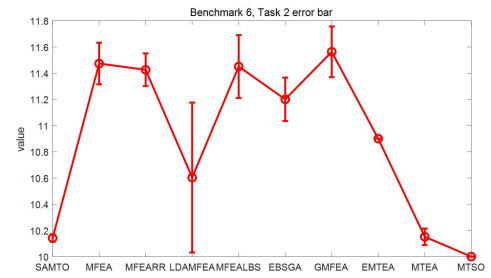
(5a)



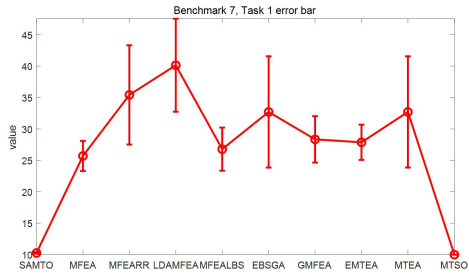
(5b)



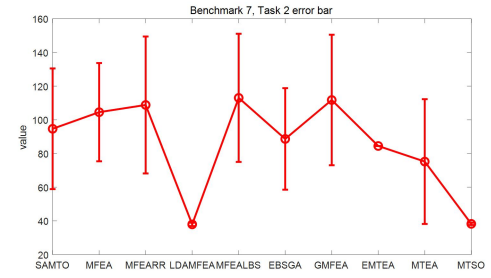
(6a)



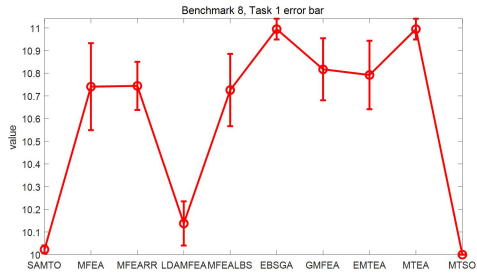
(6b)



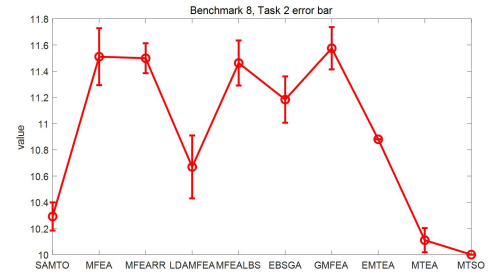
(7a)



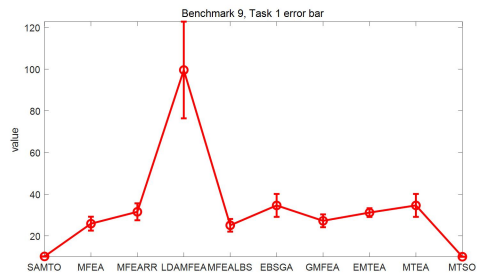
(7b)



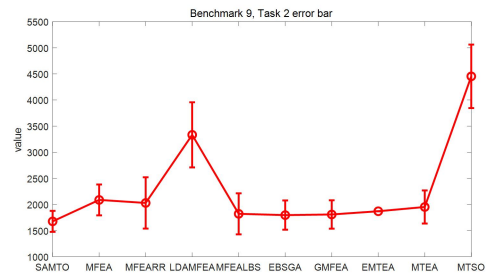
(8a)



(8b)



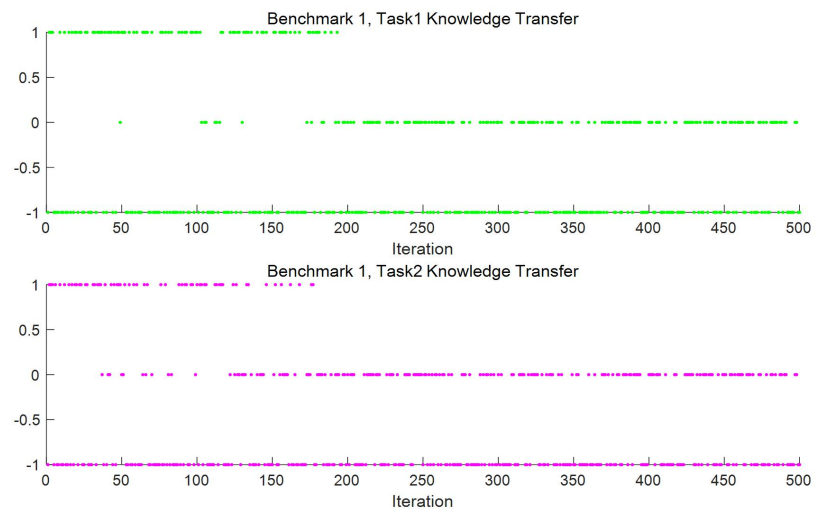
(9a)



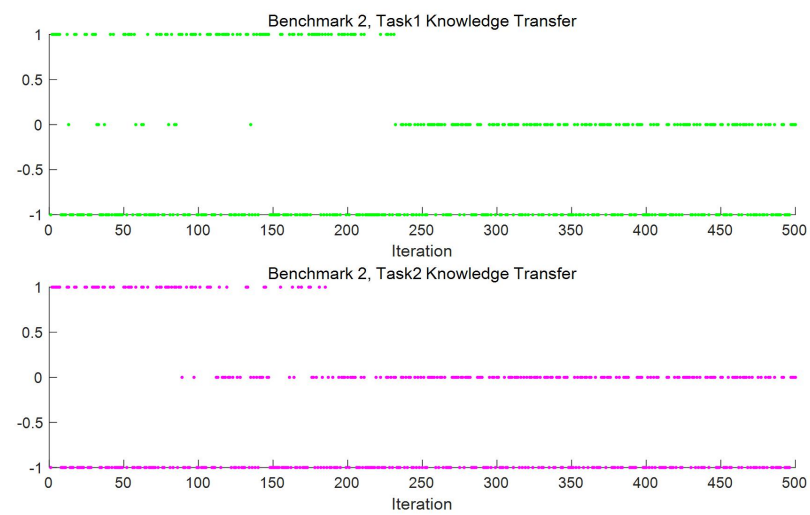
(9b)



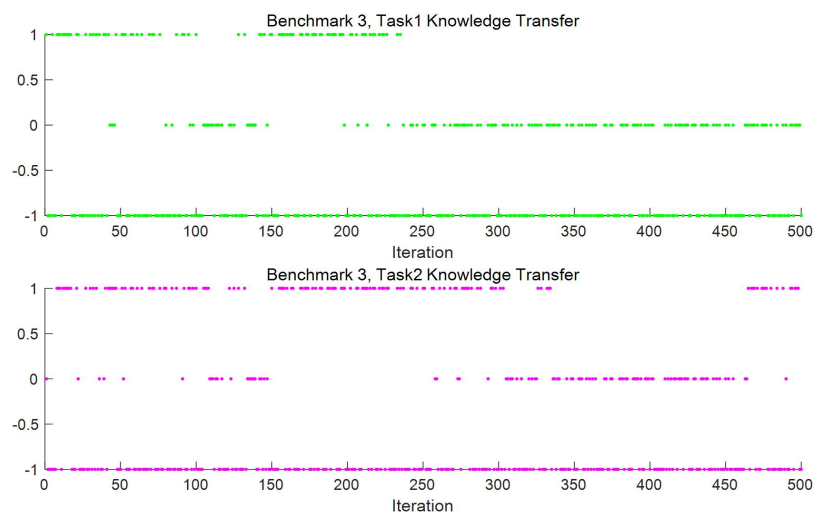
**Supplemental Figure S5 Knowledge Transfer Status During the Iterative Process**



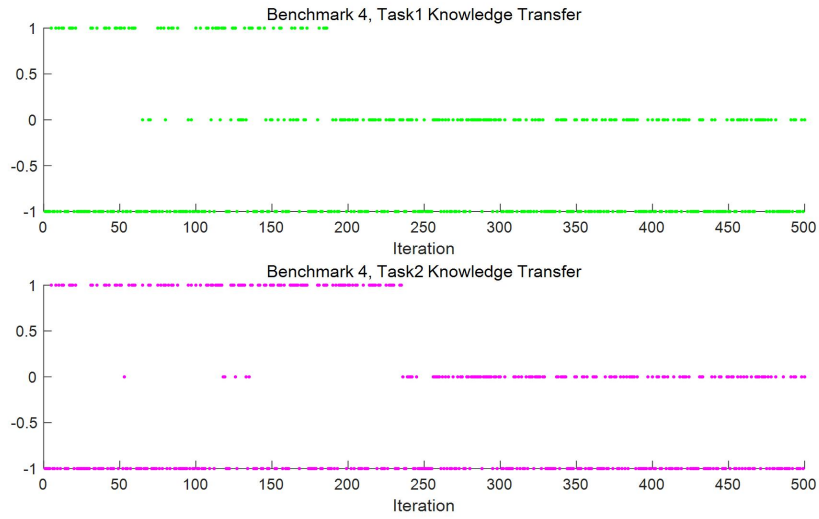
(1)



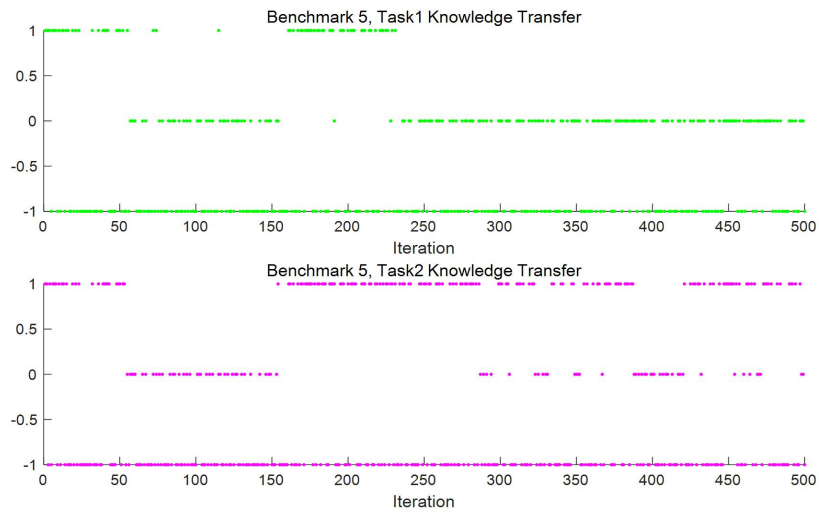
(2)



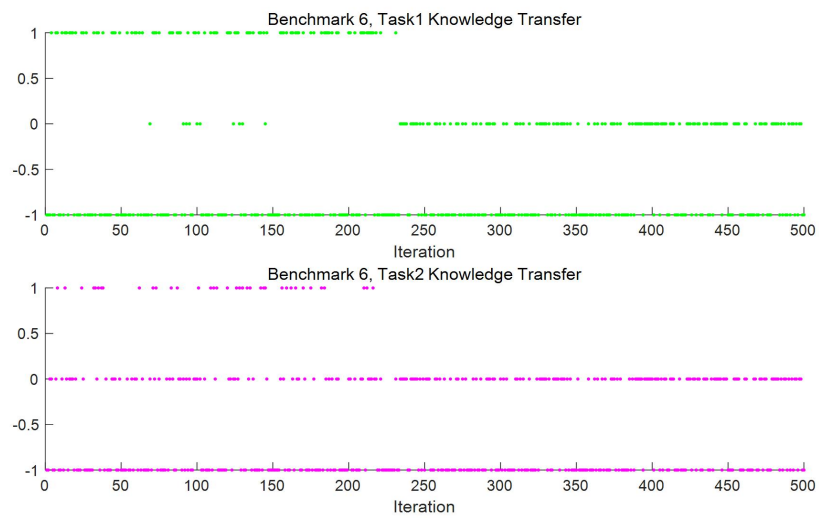
(3)



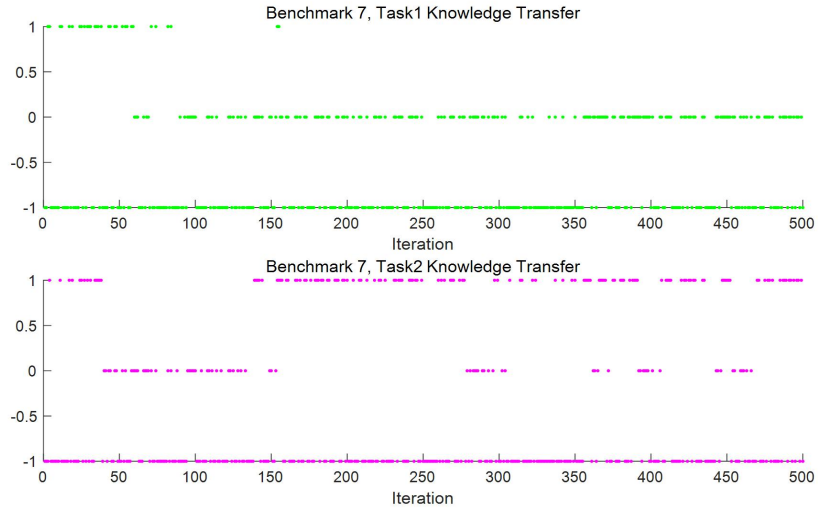
(4)



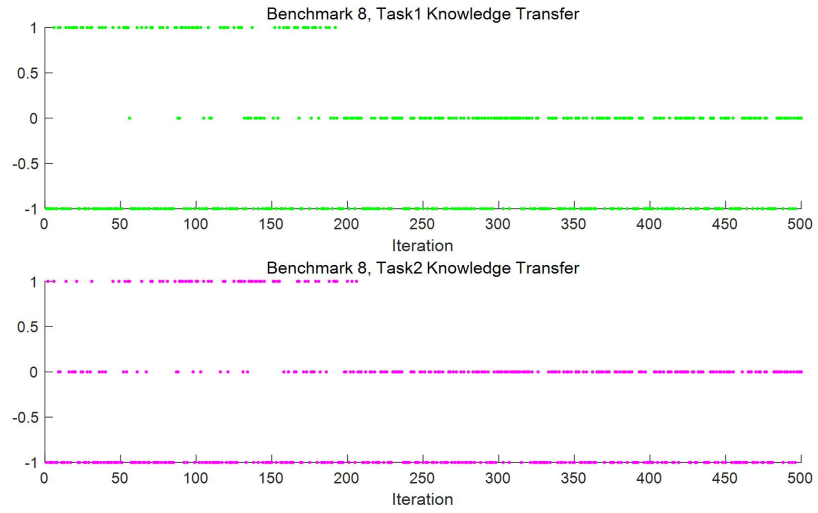
(5)



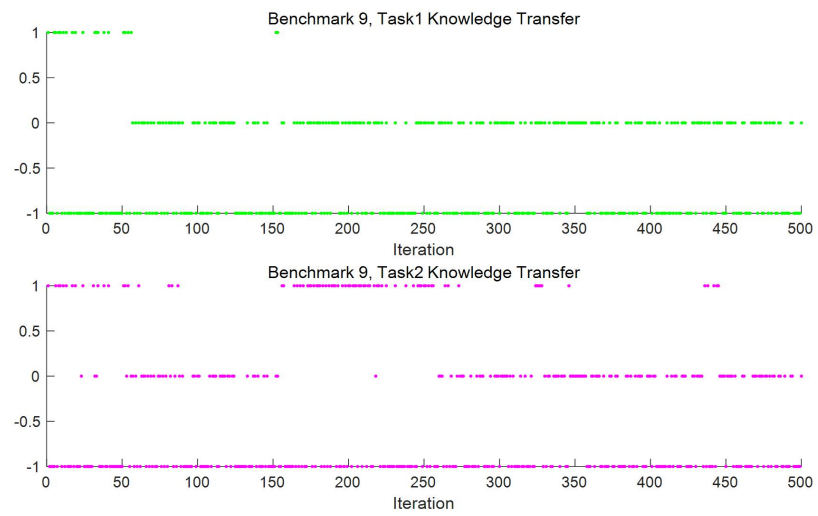
(6)



(7)

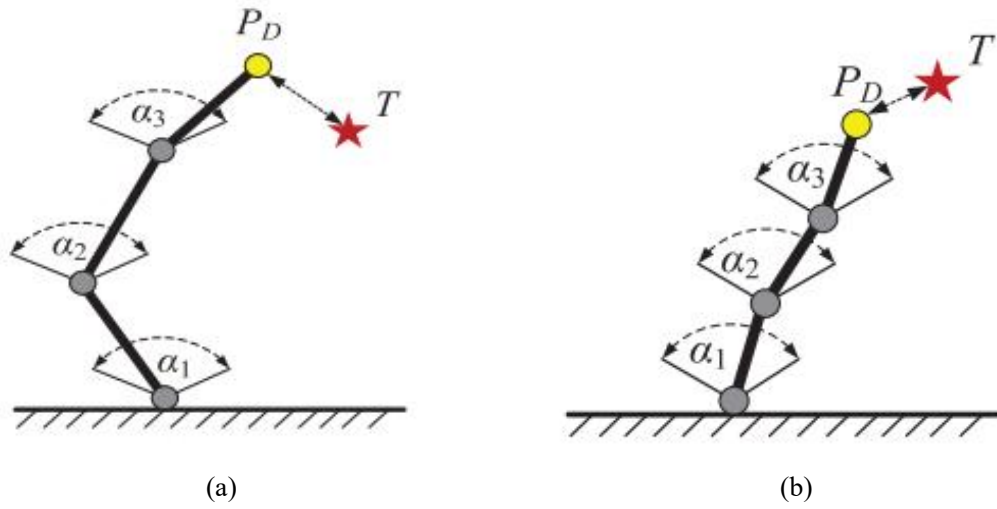


(8)

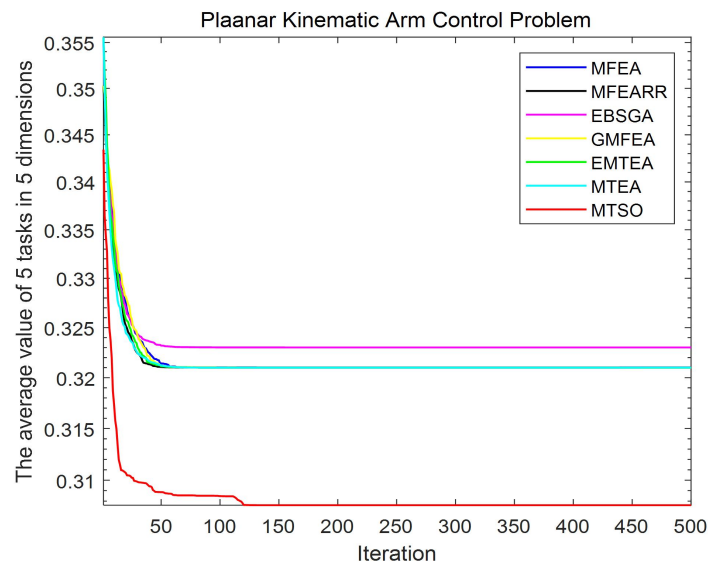


(9)

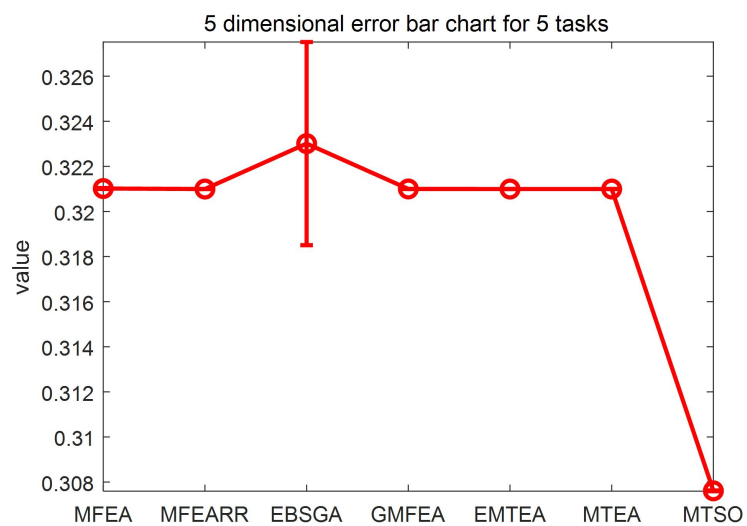
**Supplemental Figure S6** Schematic Diagram of the PKACP for Two Tasks. Task 1 (a), Task 2 (b)



**Supplemental Figure S7** Average convergence curve (a) and error bar (b) for the PKACP with 5 tasks in 5 dimensions

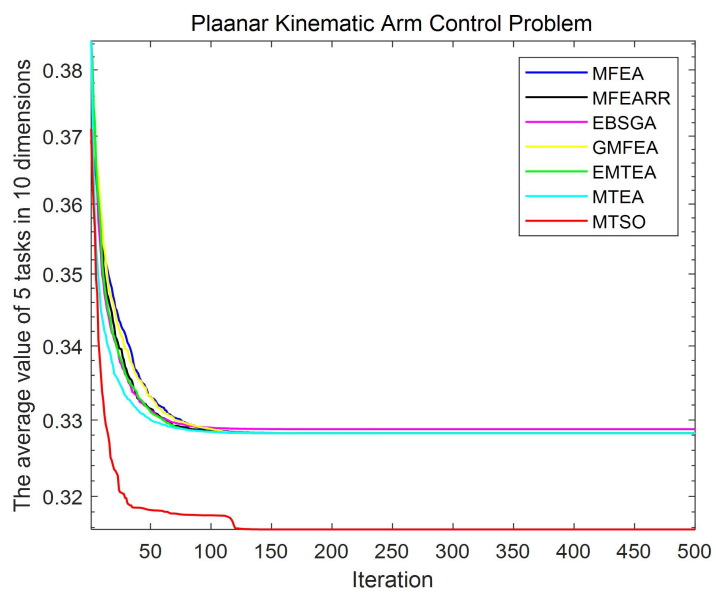


(a)

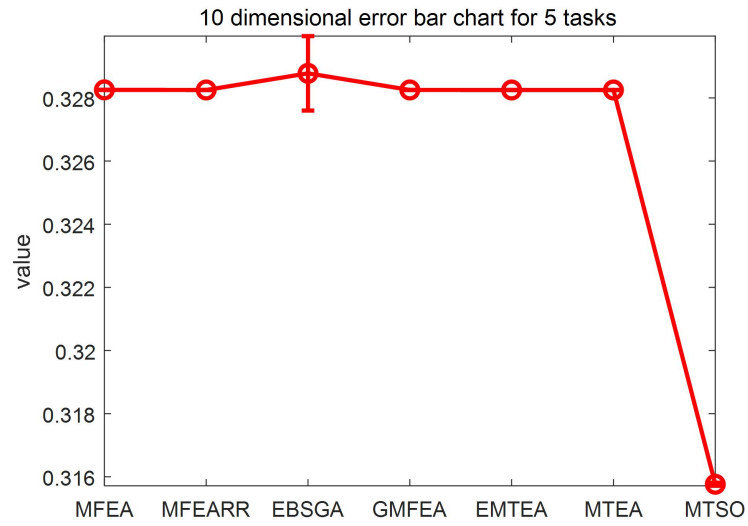


(b)

**Supplemental Figure S8** Average convergence curve(a) and error bar (b) for the PKACP with 5 tasks in 10 dimensions

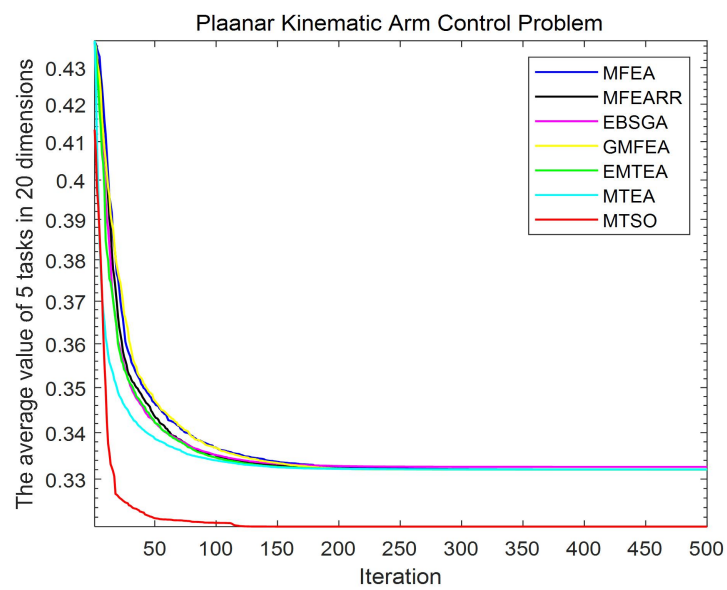


(a)



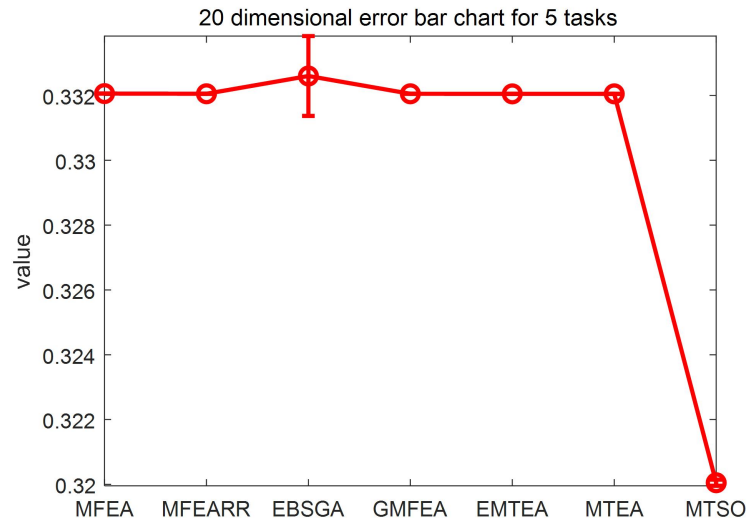
(b)

**Supplemental Figure S9** Average convergence curve (a) and error bar (b) for the PKACP with 5 tasks in 20 dimensions



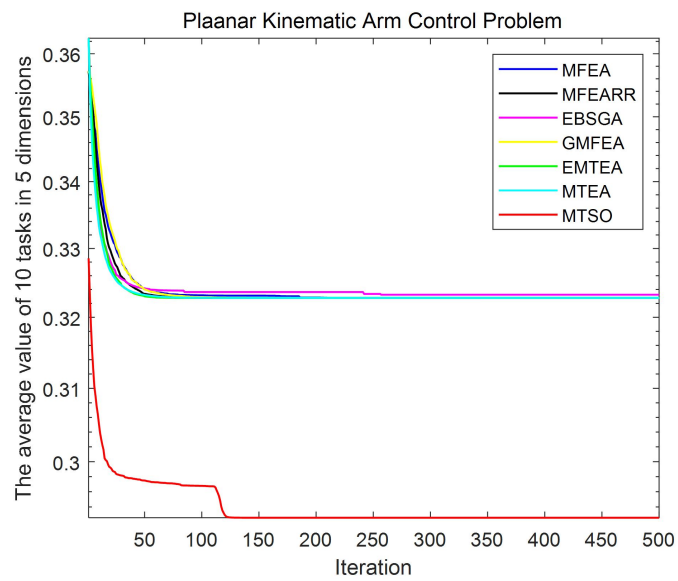
(a)



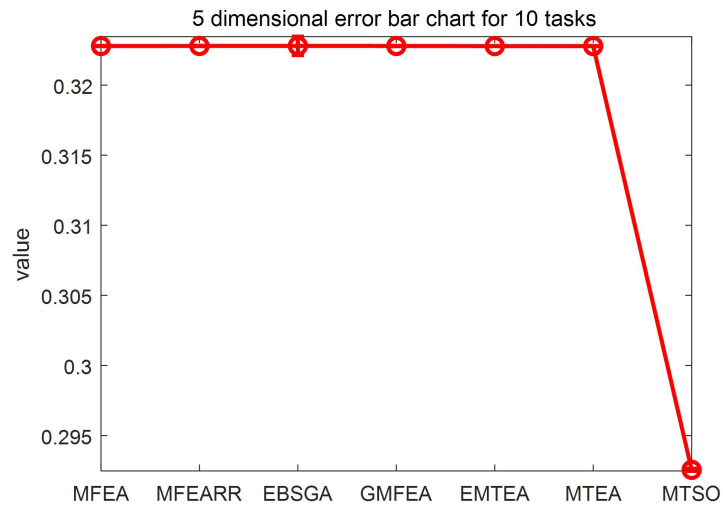


(b)

**Supplemental Figure S10** Average convergence curve (a) and error bar(b) for the PKACP with 10 tasks in 5 dimensions

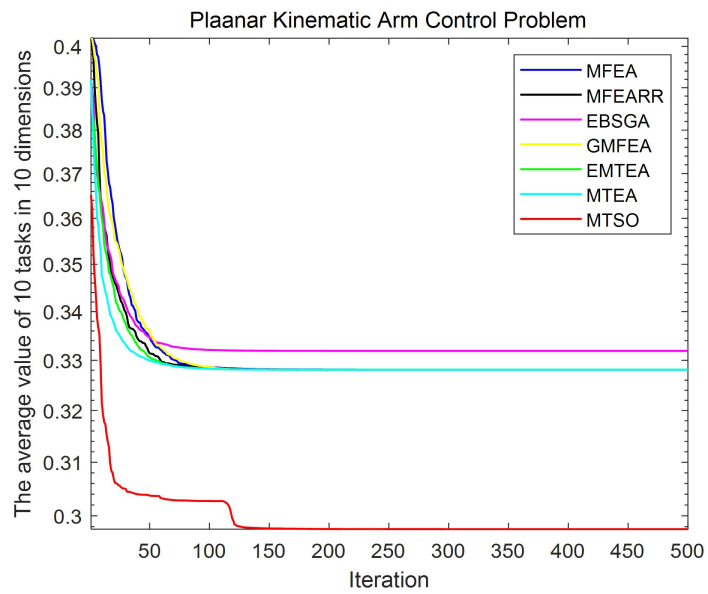


(a)

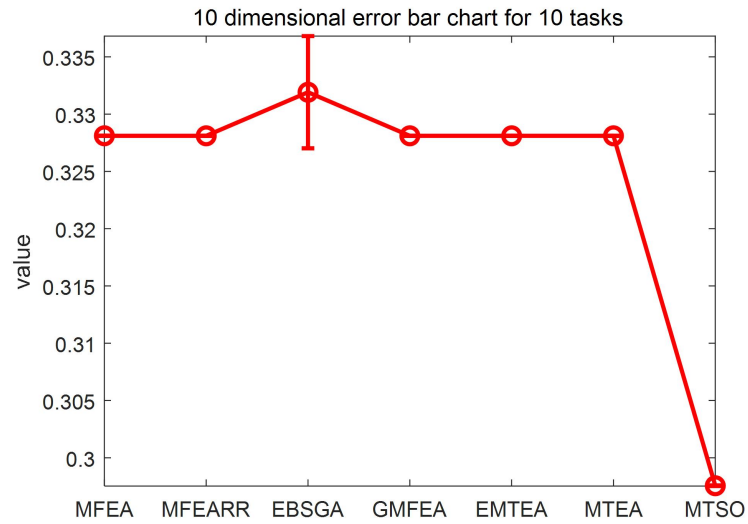


(b)

**Supplemental Figure S11** Average convergence curve (a) and error bar(b) for the PKACP with 10 tasks in 10 dimensions

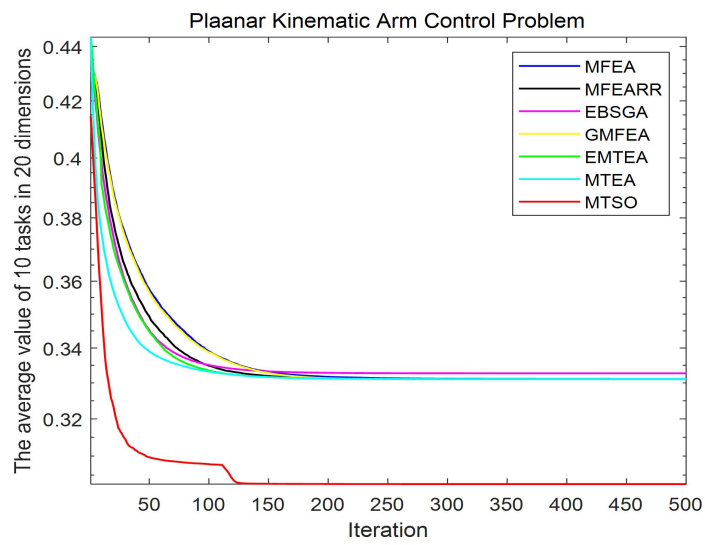


(a)

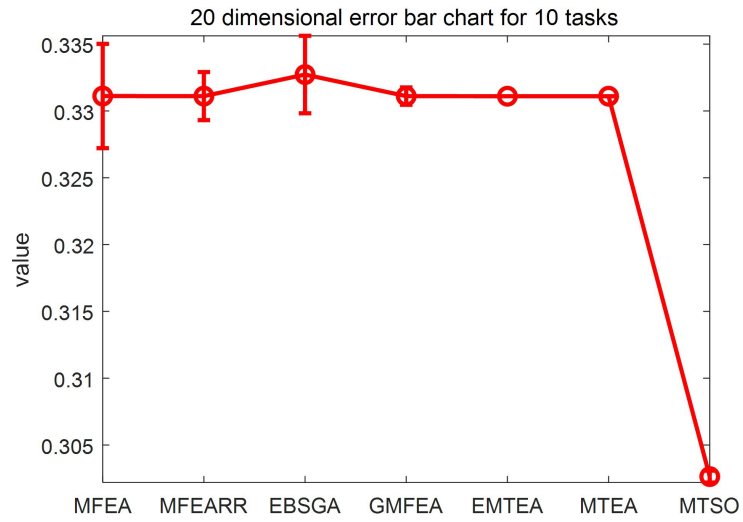


(b)

**Supplemental Figure S12** Average convergence curve (a) and error bar(b) for the PKACP with 10 tasks in 20 dimensions

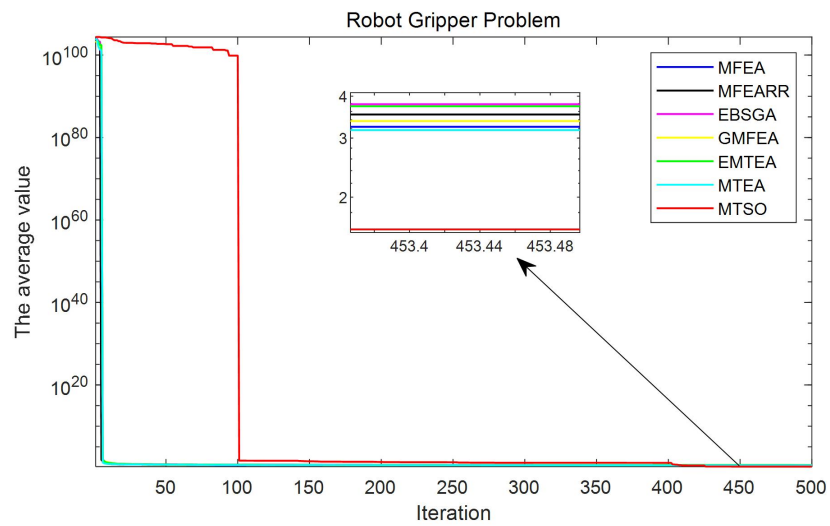


(a)

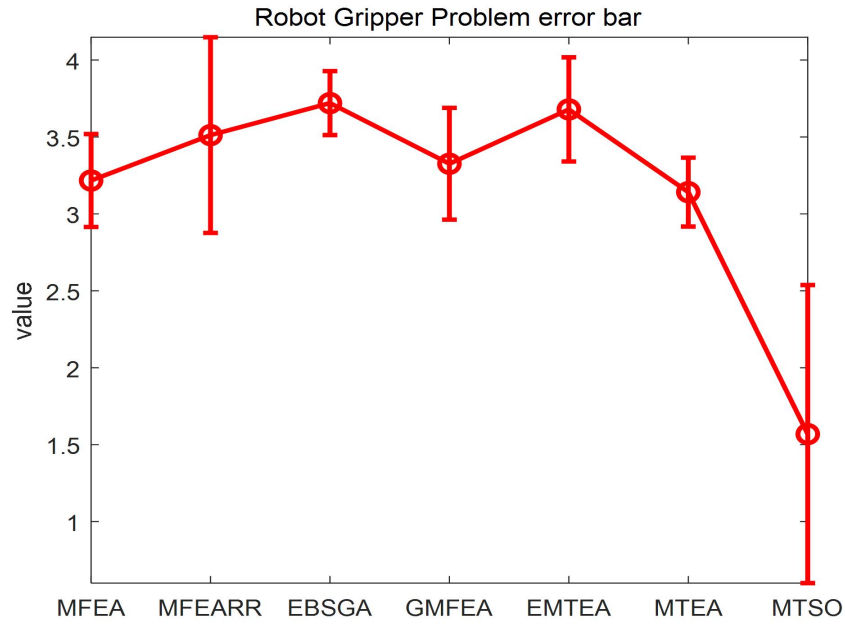


(b)

**Supplemental Figure S13** Average convergence curve(a) and error bar(b) for the robot gripper design problem

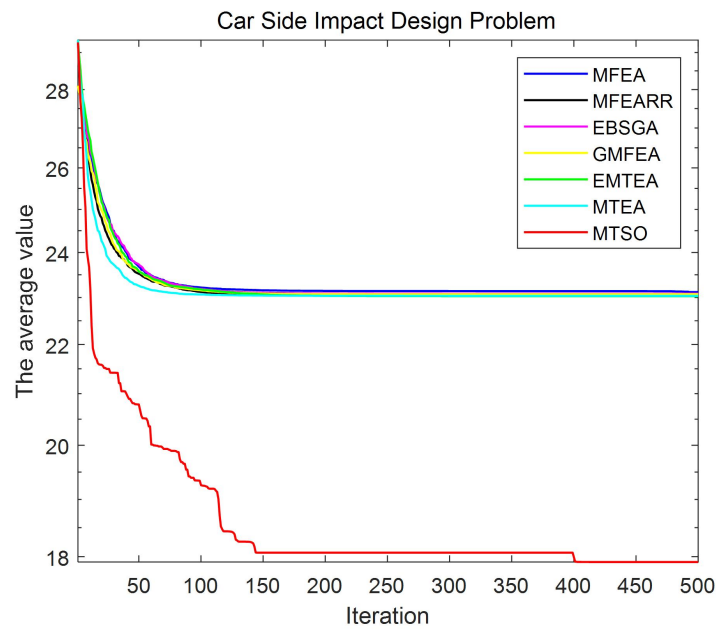


(a)

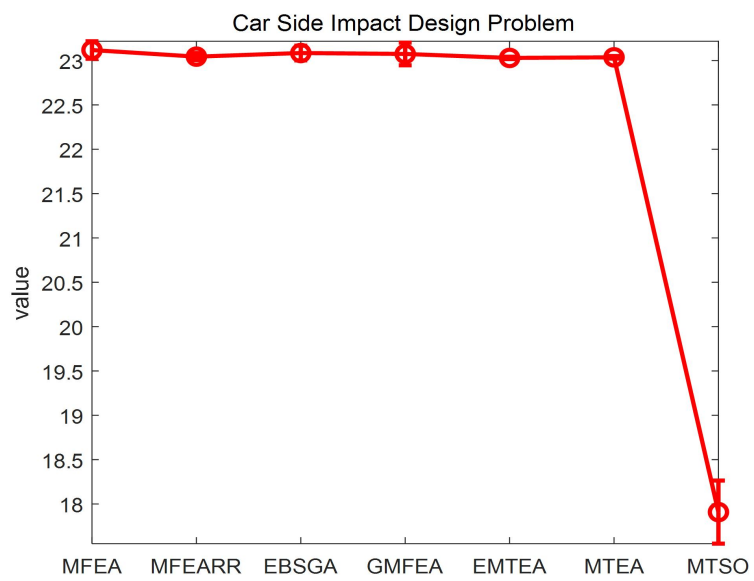


(b)

**Supplemental Figure S14** Average convergence curve(a) and error bar(b) for the car side impact design problem



(a)



(b)