

# Objective Archive Management

## Radar plots

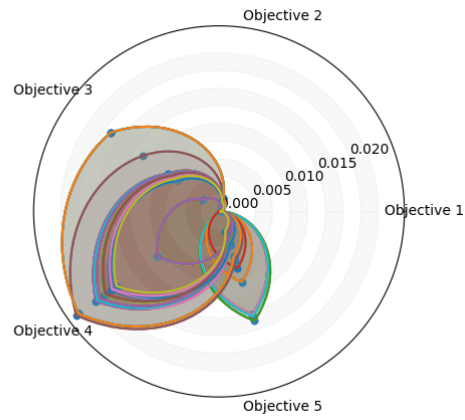
A selection of radar plots for each of the problems. These are graphs generated from a single randomly selected solution set. Since we ran each algorithm 30 times, this is only a small sampling of the total results.

Terminology:

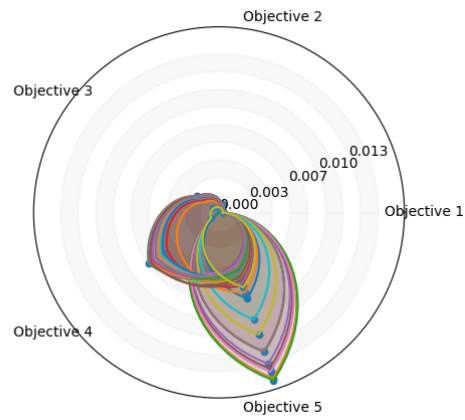
1. OAM: Objective Archive Management
2. ES: Environmental Selection
3. Single: Refers to the one time application of OAM to a solution set
4. External: Refers to the continuous updating of an external OA throughout the optimization process, and using the resulting OA to find overlapping solutions

# 1 DTLZ5

## 1.1 5 objectives

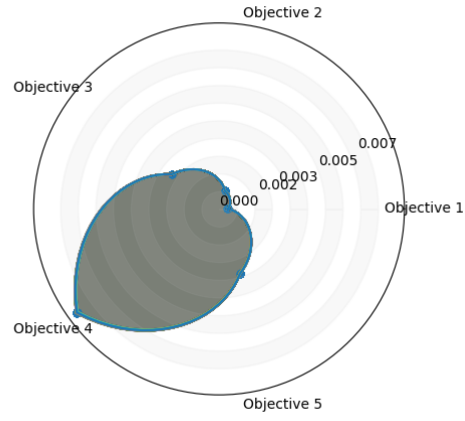


(a) ES

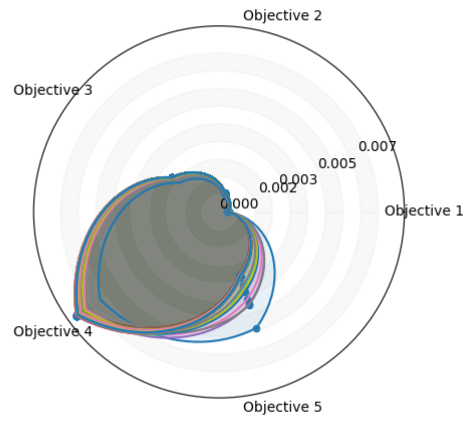


(b) OAM

Figure 1: DTLZ5 5 objectives NSGA2 external archive

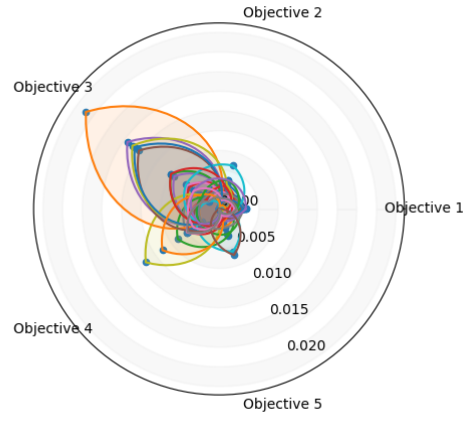


(a) ES

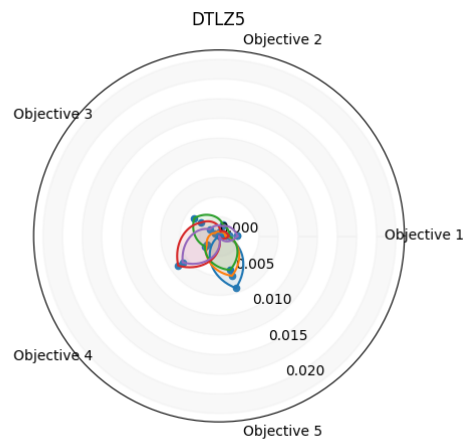


(b) OAM

Figure 2: DTLZ5 5 objectives NSGA2 single run



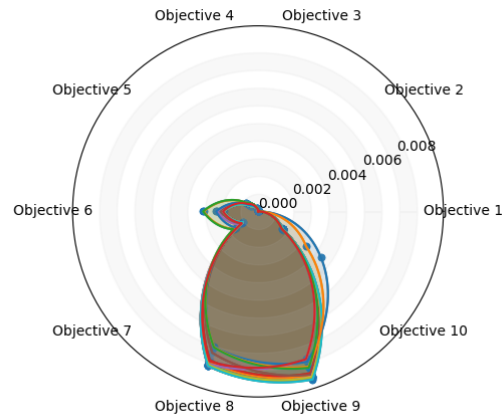
(a) NSGA3



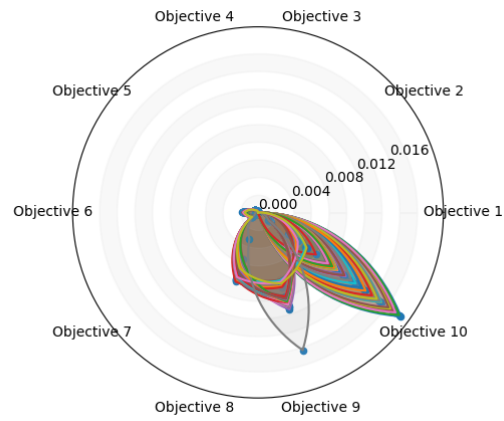
(b) OAM single

Figure 3: DTLZ5 5 objectives NSGA3

## 1.2 10 objectives

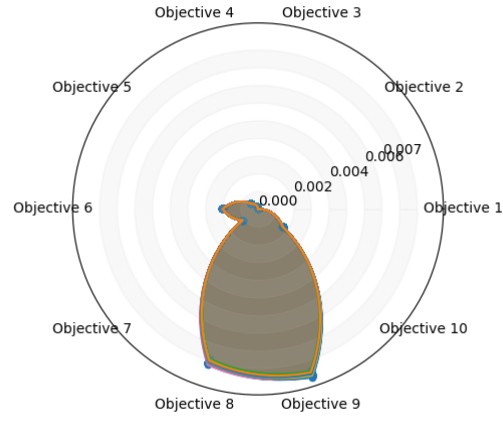


(a) ES

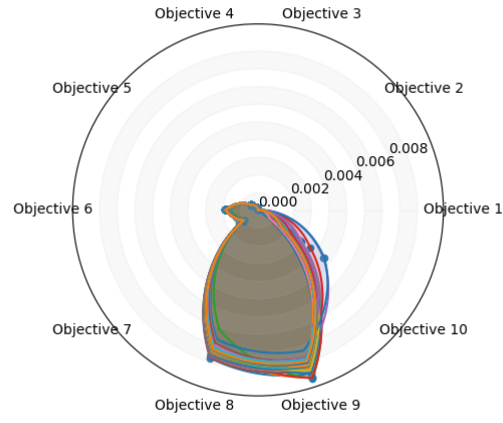


(b) OAM

Figure 4: DTLZ5 10 objectives NSGA2 external archive

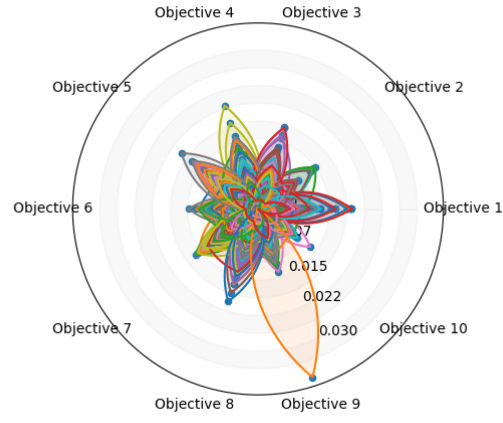


(a) ES

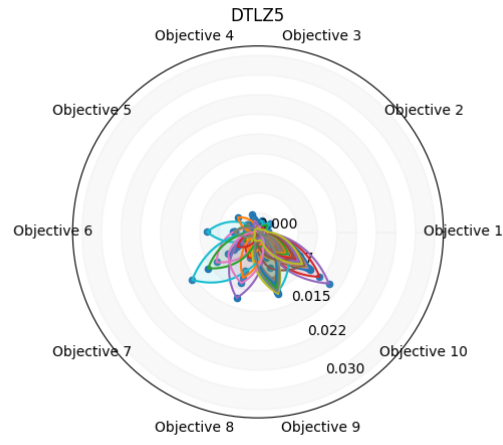


(b) OAM

Figure 5: DTLZ5 10 objectives NSGA2 single run



(a) NSGA3

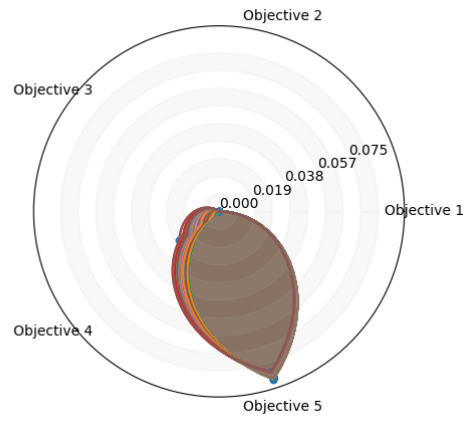


(b) OAM single

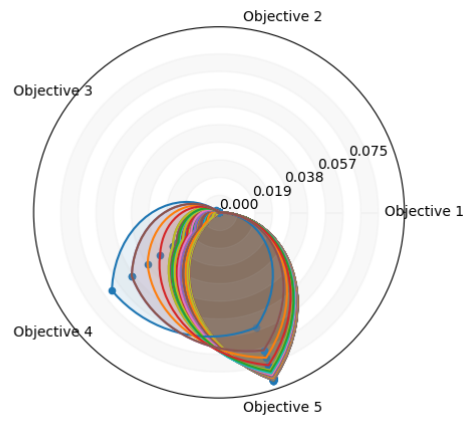
Figure 6: DTLZ5 10 objectives NSGA3

## 2 DTLZ6

### 2.1 5 objectives



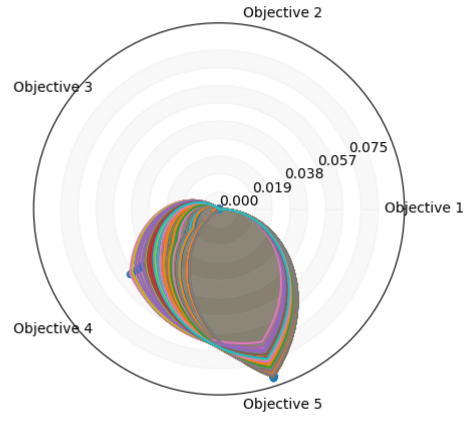
(a) ES



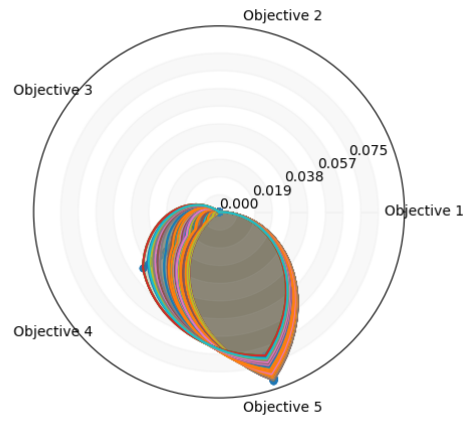
(b) OAM

Figure 7: DTLZ6 5 objectives NSGA2 external archive



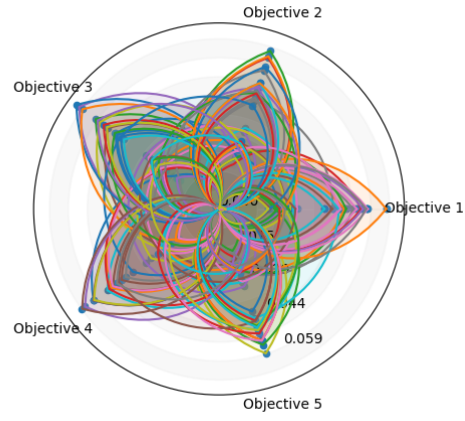


(a) ES

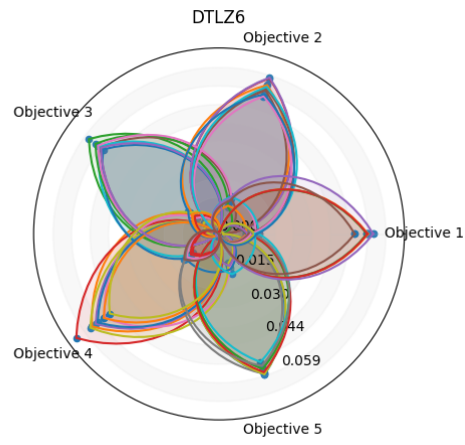


(b) OAM

Figure 8: DTLZ6 5 objectives NSGA2 single run



(a) NSGA3



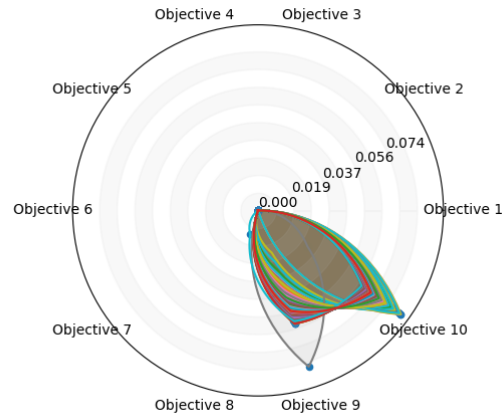
(b) OAM single

Figure 9: DTLZ6 5 objectives NSGA3

## 2.2 10 objectives

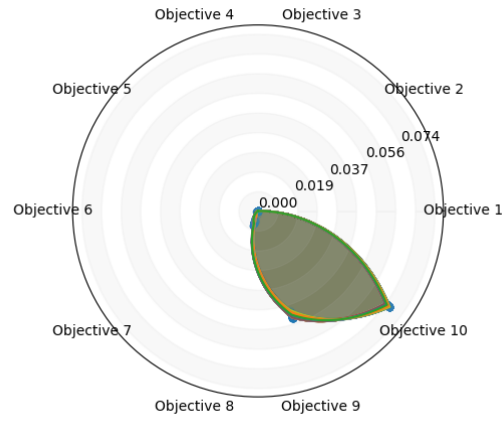


(a) ES



(b) OAM

Figure 10: DTLZ6 10 objectives NSGA2 external archive

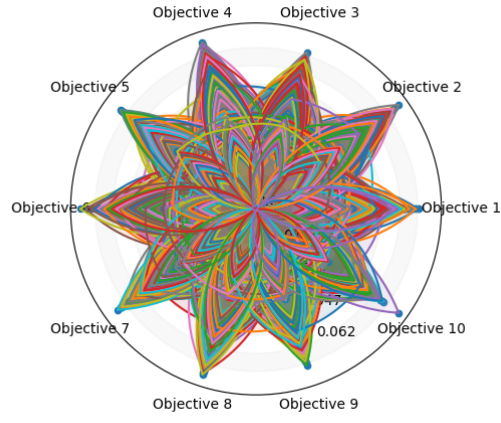


(a) ES

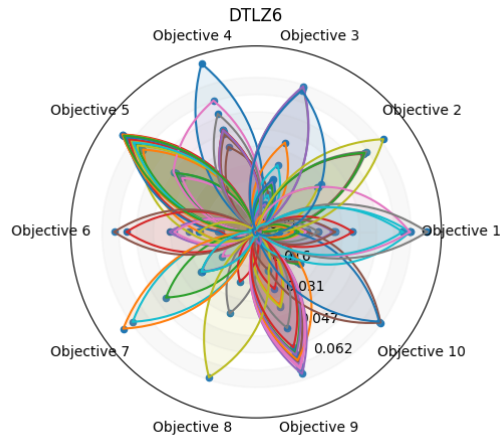


(b) OAM

Figure 11: DTLZ6 10 objectives NSGA2 single run



(a) NSGA3

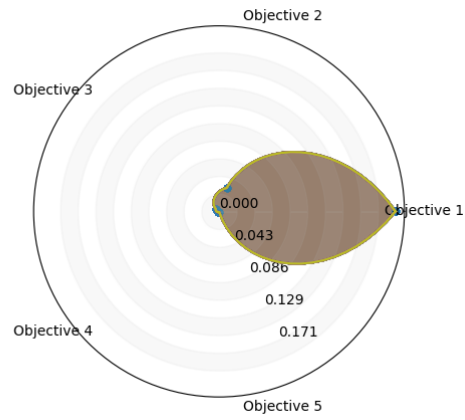


(b) OAM Single

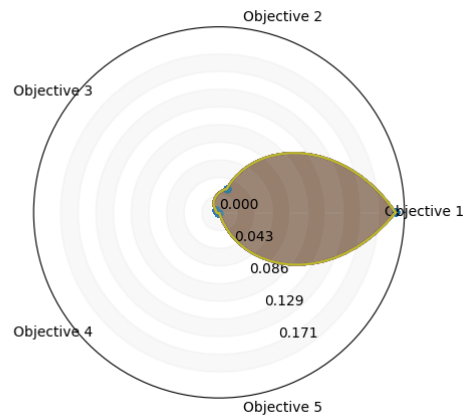
Figure 12: DTLZ6 10 objectives NSGA3

### 3 WFG3

#### 3.1 5 objectives

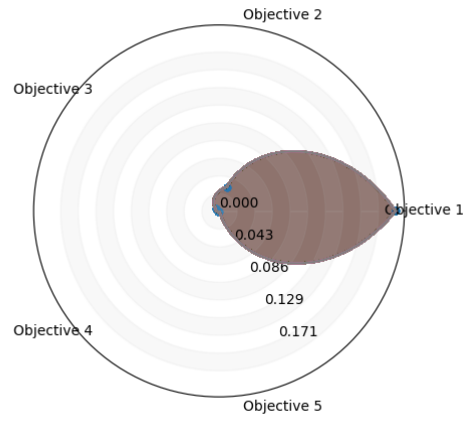


(a) ES

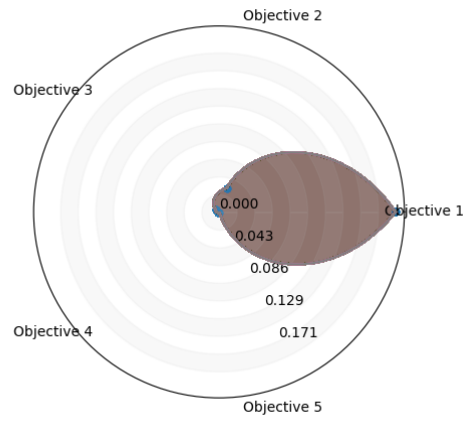


(b) OAM

Figure 13: WFG3 5 objectives NSGA2 external archive

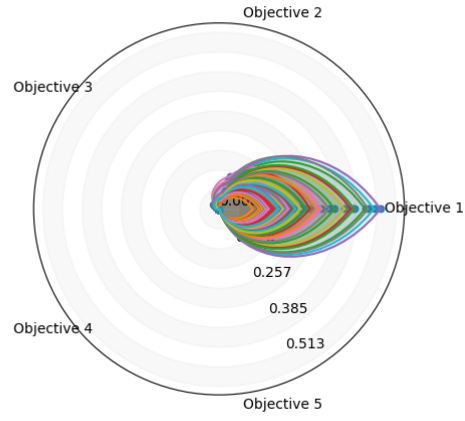


(a) ES

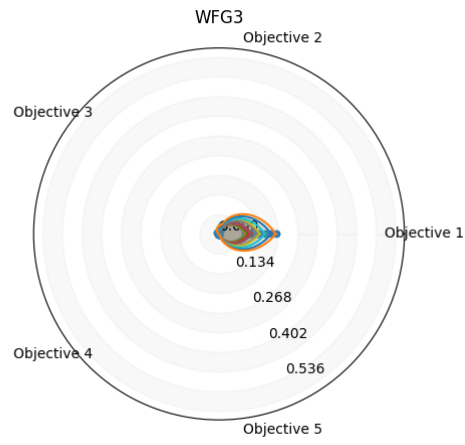


(b) OAM

Figure 14: WFG3 5 objectives NSGA2 single run



(a) NSGA3

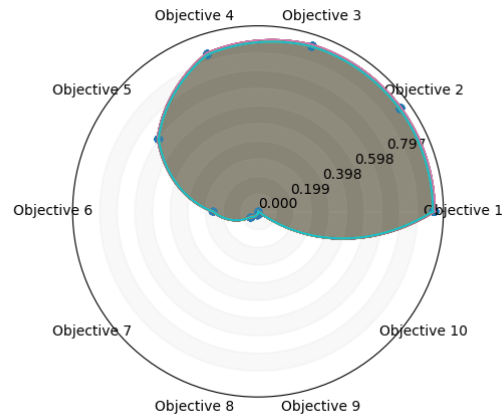


(b) OAM Single

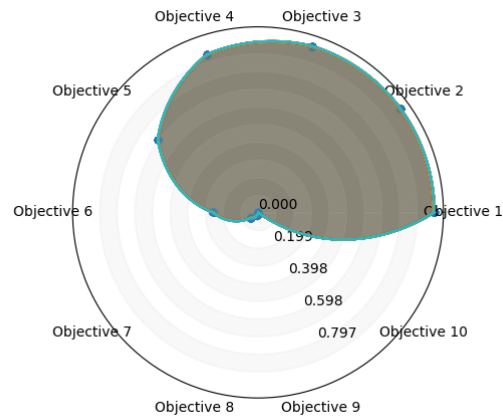
Figure 15: WFG3 5 objectives NSGA3



### 3.2 10 objectives

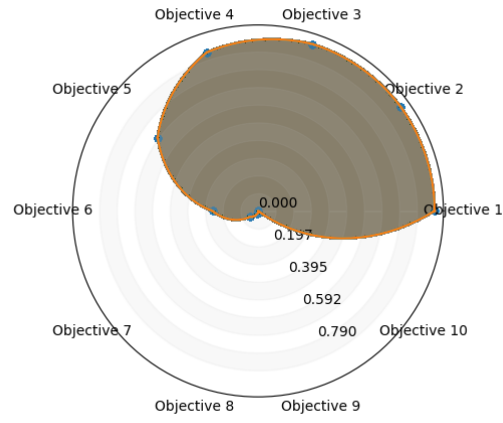


(a) ES

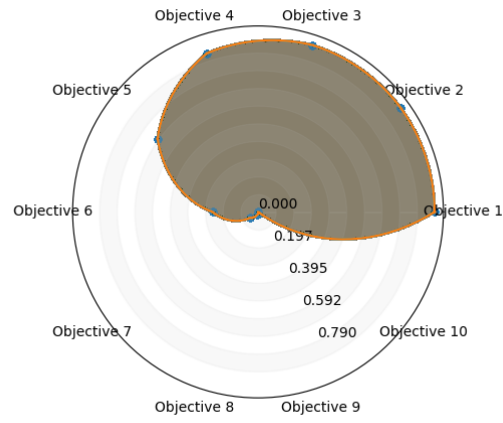


(b) OAM

Figure 16: WFG3 10 objectives NSGA2 external archive

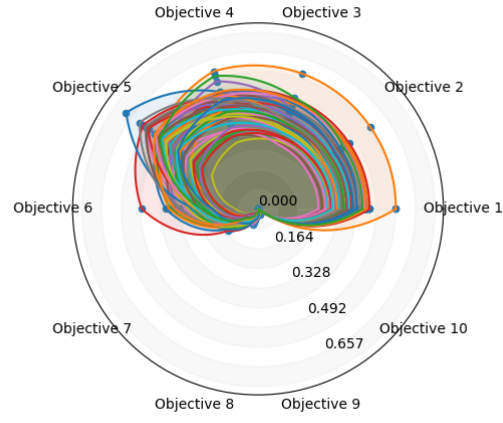


(a) ES

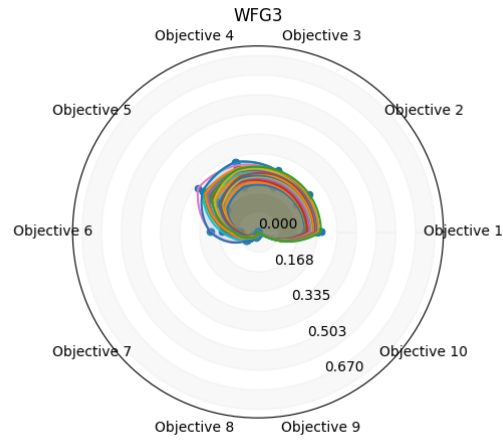


(b) OAM

Figure 17: WFG3 10 objectives NSGA2 single run



(a) NSGA3

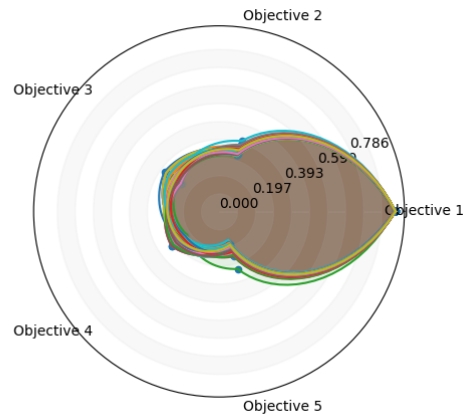


(b) OAM Single

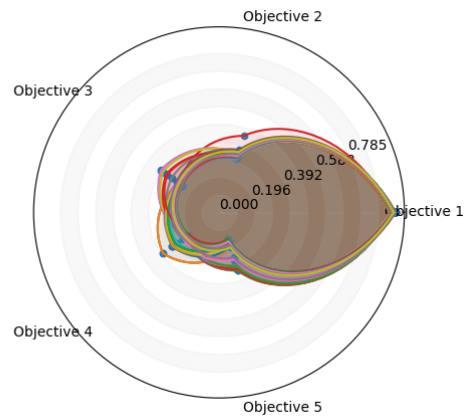
Figure 18: WFG3 10 objectives NSGA3

## 4 WFG7

### 4.1 5 objectives

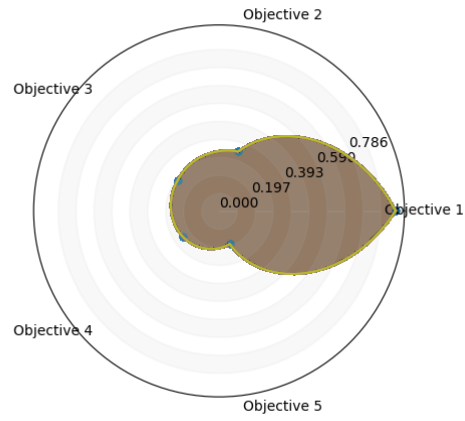


(a) ES

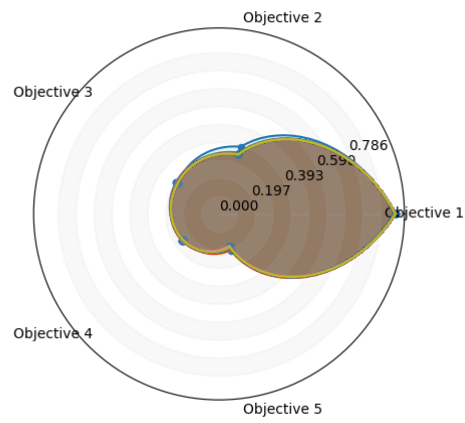


(b) OAM

Figure 19: WFG7 5 objectives NSGA2 external archive

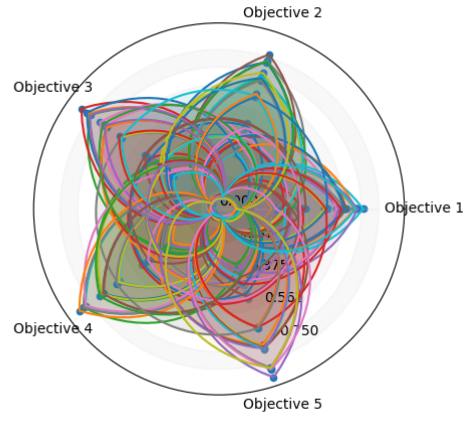


(a) External

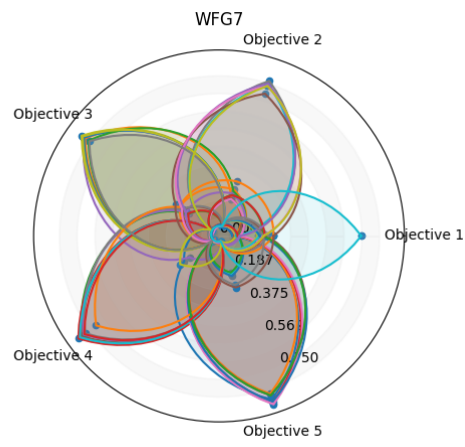


(b) Single

Figure 20: WFG7 5 objectives NSGA2 single run



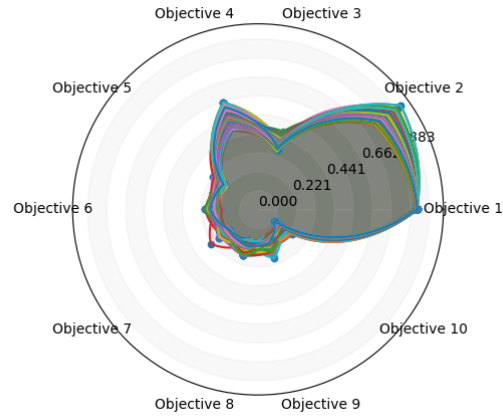
(a) NSGA3



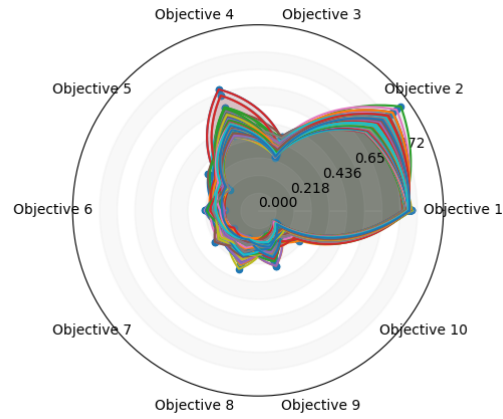
(b) OAM Single

Figure 21: WFG7 5 objectives NSGA3

## 4.2 10 objectives

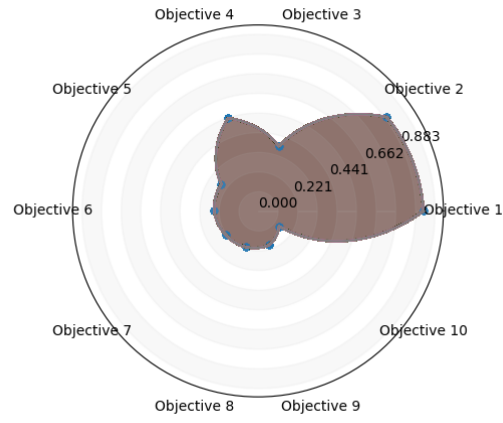


(a) ES

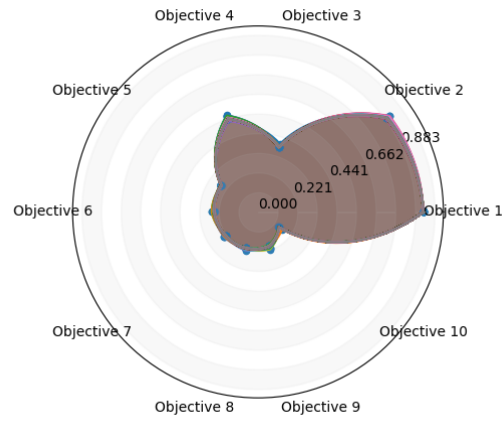


(b) OAM

Figure 22: WFG7 10 objectives NSGA2 external archive



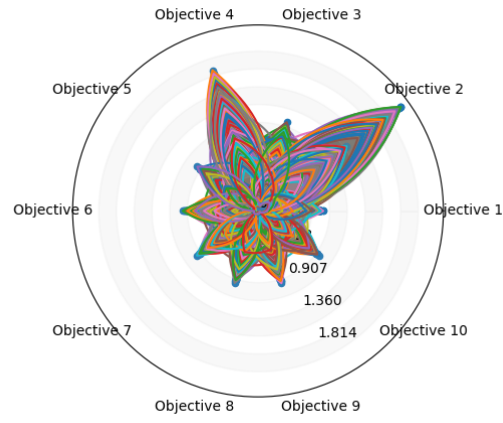
(a) ES



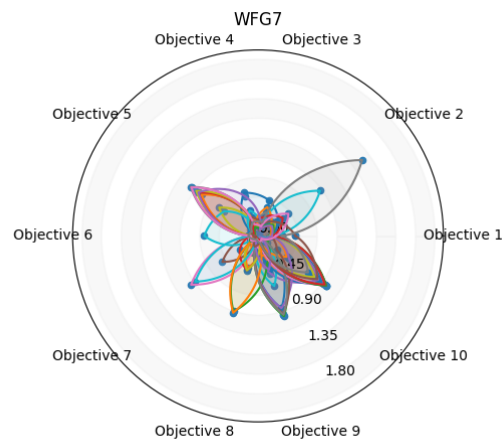
(b) OAM

Figure 23: WFG7 10 objectives NSGA2 single run





(a) NSGA3



(b) NSGA3 - OAM Single

Figure 24: WFG7 10 objectives NSGA3