## WFGStudy

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## 1 Tables

|   |                    |                          | Ta                       | able 1: HV. Mear         | n and Standard I         | Deviation                |                          |                          |
|---|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   |                    | NSGAII                   | SPEA2                    | MOEADDRA                 | MOEADD                   | AGE-MOEA-II              | ESPEA                    | GWASFGA                  |
|   | WFG1_2             | $5.77e - 01_{2.4e-02}$   | $5.20e - 01_{6.3e-02}$   | $2.61e - 01_{3.8e-02}$   | $5.23e - 01_{4.7e-02}$   | $5.67e - 01_{2.6e-02}$   | $4.64e - 01_{4.5e-02}$   | $5.93e - 01_{9.4e-03}$   |
|   | $WFG2_2$           | $5.60e - 01_{2.0e-03}$   | $5.62e - 01_{5.9e-04}$   | $5.52e - 01_{3.7e-03}$   | $5.58e - 01_{2.6e-03}$   | $5.59e - 01_{1.2e-03}$   | $5.59e - 01_{1.9e - 03}$ | $5.59e - 01_{1.3e-03}$   |
|   | $WFG3_2$           | $4.40e - 01_{3.8e-04}$   | $4.40e - 01_{4.0e-04}$   | $4.40e - 01_{2.3e-04}$   | $4.41e - 01_{3.5e-04}$   | $4.41e - 01_{3.0e-04}$   | $4.39e - 01_{1.2e-03}$   | $4.40e - 01_{4.8e-04}$   |
|   | $WFG5_2$           | $1.94e - 01_{8.8e-05}$   | $1.95e - 01_{1.9e-04}$   | $1.93e - 01_{1.6e-03}$   | $1.95e - 01_{1.1e-04}$   | $1.92e - 01_{3.4e-03}$   | $1.96e - 01_{9.7e-05}$   | $1.94e - 01_{1.6e-04}$   |
|   | $WFG4_2$           | $2.16e - 01_{5.8e-04}$   | $2.16e - 01_{3.8e-04}$   | $1.88e - 01_{1.4e-03}$   | $2.17e - 01_{1.6e-04}$   | $2.19e - 01_{1.9e-04}$   | $2.18e - 01_{2.6e-04}$   | $2.17e - 01_{2.9e-04}$   |
|   | $WFG6_2$           | $1.83e - 01_{7.5e-03}$   | $1.83e - 01_{3.5e-03}$   | $1.58e - 01_{1.3e-02}$   | $1.82e - 01_{3.6e-03}$   | $1.82e - 01_{7.6e-03}$   | $1.85e - 01_{3.5e-03}$   | $1.81e - 01_{2.4e-03}$   |
|   | $WFG7_2$           | $2.08e - 01_{3.3e-04}$   | $2.09e - 01_{1.9e-04}$   | $2.05e - 01_{3.8e-04}$   | $2.09e - 01_{3.3e - 05}$ | $2.10e - 01_{1.4e-04}$   | $2.10e - 01_{1.1e-04}$   | $2.08e - 01_{8.3e-05}$   |
|   | $WFG8_2$           | $1.73e - 01_{7.6e - 04}$ | $1.75e - 01_{3.5e - 04}$ | $1.68e - 01_{1.8e-03}$   | $1.76e - 01_{1.2e-03}$   | $1.76e - 01_{5.8e-04}$   | $1.77e - 01_{1.4e-03}$   | $1.74e - 01_{5.4e-04}$   |
|   | $WFG9_2$           | $2.22e - 01_{2.6e-02}$   | $2.00e - 01_{3.3e-02}$   | $1.95e - 01_{2.7e-02}$   | $2.22e - 01_{2.6e-02}$   | $1.87e - 01_{2.7e-02}$   | $2.28e - 01_{6.8e-03}$   | $1.98e - 01_{3.3e-02}$   |
|   | $WFG1_3$           | $3.94e - 01_{1.4e-01}$   | $4.08e - 01_{1.1e-01}$   | $2.62e - 01_{6.7e - 03}$ | $4.21e - 01_{1.3e-01}$   | $6.54e - 01_{1.8e-01}$   | $8.41e - 01_{5.4e-02}$   | $6.56e - 01_{2.0e-01}$   |
|   | $WFG2\_3$          | $8.38e - 01_{5.6e-02}$   | $8.24e - 01_{6.4e-02}$   | $8.01e - 01_{6.1e-02}$   | $8.35e - 01_{7.6e-02}$   | $8.33e - 01_{6.3e-02}$   | $8.08e - 01_{5.4e-02}$   | $8.25e - 01_{6.6e - 02}$ |
| 2 | $WFG3\_3$          | $2.89e - 01_{1.3e-02}$   | $2.62e - 01_{9.5e-03}$   | $2.34e - 01_{1.1e-02}$   | $2.13e - 01_{1.0e - 02}$ | $2.84e - 01_{1.2e-02}$   | $2.97e - 01_{7.8e - 03}$ | $2.98e - 01_{6.7e - 03}$ |
|   | $WFG5\_3$          | $3.37e - 01_{4.6e-03}$   | $3.54e - 01_{6.4e-03}$   | $3.42e - 01_{4.2e-03}$   | $3.55e - 01_{2.7e-03}$   | $3.42e - 01_{2.9e-02}$   | $3.65e - 01_{3.3e-03}$   | $3.55e - 01_{6.5e-03}$   |
|   | $WFG4\_3$          | $3.47e - 01_{4.9e-03}$   | $3.58e - 01_{3.4e-03}$   | $3.10e - 01_{6.6e-03}$   | $3.82e - 01_{7.2e-03}$   | $3.89e - 01_{6.0e-03}$   | $3.91e - 01_{5.3e-03}$   | $3.92e - 01_{4.4e-03}$   |
|   | $WFG6\_3$          | $3.21e - 01_{1.7e - 02}$ | $3.46e - 01_{8.1e-03}$   | $3.13e - 01_{7.2e - 03}$ | $3.55e - 01_{1.4e - 02}$ | $3.51e - 01_{5.8e-03}$   | $3.64e - 01_{8.5e-03}$   | $3.59e - 01_{5.1e-03}$   |
|   | $WFG7\_3$          | $3.52e - 01_{5.2e-03}$   | $3.76e - 01_{4.5e - 03}$ | $3.31e - 01_{2.1e-02}$   | $3.90e - 01_{4.6e-03}$   | $4.00e - 01_{3.6e-03}$   | $3.93e - 01_{2.6e-03}$   | $3.90e - 01_{3.2e-03}$   |
|   | $WFG8_{-3}$        | $2.74e - 01_{8.2e-03}$   | $2.94e - 01_{3.1e-03}$   | $2.28e - 01_{2.8e-02}$   | $3.08e - 01_{6.6e-03}$   | $3.06e - 01_{4.6e-03}$   | $2.97e - 01_{6.3e-03}$   | $2.95e - 01_{5.2e-03}$   |
|   | $WFG9\_3$          | $2.89e - 01_{7.0e-03}$   | $3.26e - 01_{1.6e-02}$   | $3.04e - 01_{3.8e - 03}$ | $3.30e - 01_{2.2e-02}$   | $3.38e - 01_{3.1e-02}$   | $3.17e - 01_{1.9e-02}$   | $2.91e - 01_{8.3e-04}$   |
|   | $WFG1_5$           | $1.36e - 01_{5.4e-02}$   | $1.40e - 02_{8.8e-03}$   | $2.42e - 01_{7.8e-02}$   | $3.27e - 01_{4.5e - 02}$ | $4.40e - 01_{7.2e-02}$   | $9.70e - 01_{8.4e-03}$   | $8.22e - 01_{3.9e-02}$   |
|   | $WFG2_5$           | $8.40e - 01_{4.5e-02}$   | $8.11e - 01_{4.0e-02}$   | $8.32e - 01_{5.5e - 02}$ | $8.75e - 01_{2.4e - 03}$ | $9.05e - 01_{1.0e-01}$   | $9.24e - 01_{6.5e-03}$   | $9.26e - 01_{7.6e-02}$   |
|   | $WFG3_5$           | $1.20e - 01_{1.6e-02}$   | $0.00e + 00_{0.0e+00}$   | $5.68e - 05_{1.3e-04}$   | $6.56e - 03_{6.4e-03}$   | $1.26e - 01_{4.3e-03}$   | $1.60e - 01_{5.6e-03}$   | $1.48e - 01_{1.5e-03}$   |
|   | $WFG5\_5$          | $4.44e - 01_{1.5e-02}$   | $4.26e - 01_{2.0e-02}$   | $5.07e - 01_{9.2e - 03}$ | $5.46e - 01_{2.8e-03}$   | $5.45e - 01_{5.9e-02}$   | $6.00e - 01_{2.9e-03}$   | $5.56e - 01_{1.2e-02}$   |
|   | $WFG4\_5$          | $3.51e - 01_{9.8e-03}$   | $3.33e - 01_{1.0e-02}$   | $2.80e - 01_{2.2e-02}$   | $4.67e - 01_{2.5e-03}$   | $5.16e - 01_{3.8e - 03}$ | $5.18e - 01_{5.3e-03}$   | $4.85e - 01_{1.2e-02}$   |
|   | $WFG6\_5$          | $3.88e - 01_{1.0e-02}$   | $4.06e - 01_{1.8e-02}$   | $4.53e - 01_{2.2e-02}$   | $5.53e - 01_{6.7e - 03}$ | $5.54e - 01_{2.2e-02}$   | $5.92e - 01_{1.1e - 02}$ | $5.66e - 01_{5.3e-03}$   |
|   | $WFG7_5$           | $3.05e - 01_{2.9e-02}$   | $2.38e - 01_{3.7e-02}$   | $2.68e - 01_{2.6e-02}$   | $4.75e - 01_{3.6e-03}$   | $5.32e - 01_{4.4e-03}$   | $5.27e - 01_{1.3e-03}$   | $4.80e - 01_{4.3e-02}$   |
|   | $WFG8\_5$          | $3.38e - 01_{1.6e-02}$   | $2.87e - 01_{1.2e-02}$   | $2.99e - 01_{4.3e-02}$   | $4.75e - 01_{1.3e-03}$   | $4.99e - 01_{6.9e - 03}$ | $4.96e - 01_{2.5e-03}$   | $3.54e - 01_{1.2e-02}$   |
|   | WFG9 <sub>-5</sub> | $3.87e - 01_{1.0e - 02}$ | $3.90e - 01_{5.4e-02}$   | $4.93e - 01_{2.7e - 02}$ | $5.42e - 01_{1.3e - 02}$ | $5.56e - 01_{3.5e - 02}$ | $5.23e - 01_{8.8e-03}$   | $3.46e - 01_{1.1e-02}$   |

|   |                     |                          | Tal                      | ole 2: HV. Media         | n and Interquart         | ile Range                |                          |                          |
|---|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   |                     | NSGAII                   | SPEA2                    | MOEADDRA                 | MOEADD                   | AGE-MOEA-II              | ESPEA                    | GWASFGA                  |
|   | WFG1_2              | $5.92e - 01_{4.5e-02}$   | $5.25e - 01_{1.2e-01}$   | $2.41e - 01_{6.9e-02}$   | $5.41e - 01_{8.8e-02}$   | $5.64e - 01_{4.8e-02}$   | $4.67e - 01_{7.4e-02}$   | $5.95e - 01_{1.3e - 02}$ |
|   | $WFG2_2$            | $5.59e - 01_{3.6e-03}$   | $5.62e - 01_{1.0e-03}$   | $5.54e - 01_{4.6e-03}$   | $5.58e - 01_{3.8e-03}$   | $5.58e - 01_{2.2e-03}$   | $5.59e - 01_{3.4e-03}$   | $5.59e - 01_{2.2e-03}$   |
|   | $WFG3_2$            | $4.40e - 01_{6.8e-04}$   | $4.40e - 01_{6.1e-04}$   | $4.40e - 01_{4.2e-04}$   | $4.41e - 01_{6.9e-04}$   | $4.41e - 01_{5.6e-04}$   | $4.40e - 01_{2.2e-03}$   | $4.40e - 01_{9.0e-04}$   |
|   | $WFG5\_2$           | $1.95e - 01_{1.5e-04}$   | $1.95e - 01_{3.2e-04}$   | $1.94e - 01_{2.6e-03}$   | $1.95e - 01_{1.6e-04}$   | $1.94e - 01_{5.2e-03}$   | $1.96e - 01_{1.7e-04}$   | $1.94e - 01_{3.0e-04}$   |
|   | $WFG4_2$            | $2.16e - 01_{8.9e-04}$   | $2.16e - 01_{7.4e-04}$   | $1.88e - 01_{2.2e-03}$   | $2.17e - 01_{2.5e-04}$   | $2.19e - 01_{3.0e-04}$   | $2.18e - 01_{4.5e-04}$   | $2.16e - 01_{5.3e-04}$   |
|   | $WFG6_2$            | $1.82e - 01_{1.1e-02}$   | $1.84e - 01_{6.7e-03}$   | $1.53e - 01_{1.4e-02}$   | $1.84e - 01_{6.6e-03}$   | $1.79e - 01_{9.0e-03}$   | $1.84e - 01_{6.3e-03}$   | $1.82e - 01_{4.4e-03}$   |
|   | $WFG7_2$            | $2.08e - 01_{6.1e-04}$   | $2.09e - 01_{3.7e-04}$   | $2.05e - 01_{6.8e-04}$   | $2.09e - 01_{5.4e-05}$   | $2.10e - 01_{2.5e-04}$   | $2.10e - 01_{2.0e-04}$   | $2.09e - 01_{1.5e-04}$   |
|   | $WFG8_2$            | $1.73e - 01_{1.2e-03}$   | $1.75e - 01_{5.6e-04}$   | $1.68e - 01_{3.5e-03}$   | $1.77e - 01_{2.2e-03}$   | $1.77e - 01_{8.1e-04}$   | $1.76e - 01_{2.6e-03}$   | $1.74e - 01_{9.9e-04}$   |
|   | $WFG9_2$            | $2.34e - 01_{3.2e-02}$   | $1.76e - 01_{6.1e-02}$   | $1.75e - 01_{5.0e-02}$   | $2.32e - 01_{3.4e - 02}$ | $1.75e - 01_{3.0e-02}$   | $2.29e - 01_{1.2e-02}$   | $1.74e - 01_{6.1e-02}$   |
|   | $WFG1_3$            | $3.38e - 01_{1.9e-01}$   | $4.04e - 01_{1.9e-01}$   | $2.60e - 01_{9.1e-03}$   | $3.92e - 01_{2.1e-01}$   | $5.46e - 01_{3.3e-01}$   | $8.15e - 01_{1.0e-01}$   | $5.87e - 01_{3.8e-01}$   |
|   | $WFG2\_3$           | $8.68e - 01_{1.1e-01}$   | $7.78e - 01_{1.2e-01}$   | $8.25e - 01_{1.2e-01}$   | $8.89e - 01_{1.4e-01}$   | $7.90e - 01_{1.2e-01}$   | $7.86e - 01_{6.7e-02}$   | $7.81e - 01_{1.2e-01}$   |
| ಬ | $WFG3\_3$           | $2.92e - 01_{2.3e-02}$   | $2.64e - 01_{1.8e-02}$   | $2.41e - 01_{2.1e-02}$   | $2.13e - 01_{1.7e-02}$   | $2.84e - 01_{2.1e-02}$   | $2.98e - 01_{1.4e-02}$   | $3.00e - 01_{9.6e-03}$   |
|   | $WFG5\_3$           | $3.39e - 01_{8.8e - 03}$ | $3.53e - 01_{1.1e-02}$   | $3.41e - 01_{6.6e - 03}$ | $3.54e - 01_{5.0e-03}$   | $3.54e - 01_{3.4e - 02}$ | $3.65e - 01_{5.4e-03}$   | $3.51e - 01_{1.2e-02}$   |
|   | $WFG4_3$            | $3.46e - 01_{8.8e - 03}$ | $3.58e - 01_{5.8e - 03}$ | $3.10e - 01_{1.1e-02}$   | $3.79e - 01_{9.5e - 03}$ | $3.91e - 01_{9.8e-03}$   | $3.92e - 01_{1.0e - 02}$ | $3.92e - 01_{8.0e-03}$   |
|   | $WFG6\_3$           | $3.21e - 01_{3.0e-02}$   | $3.46e - 01_{1.5e-02}$   | $3.09e - 01_{1.4e-02}$   | $3.59e - 01_{2.4e-02}$   | $3.51e - 01_{1.1e-02}$   | $3.64e - 01_{1.6e-02}$   | $3.60e - 01_{8.9e-03}$   |
|   | $WFG7\_3$           | $3.49e - 01_{9.6e-03}$   | $3.78e - 01_{6.1e-03}$   | $3.22e - 01_{4.1e-02}$   | $3.88e - 01_{8.8e-03}$   | $4.01e - 01_{6.4e-03}$   | $3.94e - 01_{4.2e-03}$   | $3.90e - 01_{6.1e-03}$   |
|   | $WFG8\_3$           | $2.71e - 01_{1.5e-02}$   | $2.95e - 01_{5.7e - 03}$ | $2.18e - 01_{4.9e-02}$   | $3.05e - 01_{1.1e-02}$   | $3.04e - 01_{8.9e-03}$   | $2.99e - 01_{9.9e-03}$   | $2.96e - 01_{1.0e-02}$   |
|   | $WFG9_3$            | $2.92e - 01_{1.4e-02}$   | $3.16e - 01_{2.7e-02}$   | $3.06e - 01_{6.2e-03}$   | $3.39e - 01_{4.3e-02}$   | $3.17e - 01_{5.6e-02}$   | $3.09e - 01_{2.3e-02}$   | $2.92e - 01_{1.6e-03}$   |
|   | $WFG1_5$            | $1.20e - 01_{9.6e-02}$   | $1.57e - 02_{1.3e-02}$   | $2.58e - 01_{1.3e-01}$   | $3.08e - 01_{6.9e-02}$   | $4.23e - 01_{1.4e-01}$   | $9.69e - 01_{1.6e-02}$   | $8.14e - 01_{7.6e-02}$   |
|   | $WFG2\_5$           | $8.61e - 01_{6.4e-02}$   | $8.18e - 01_{5.7e-02}$   | $8.54e - 01_{7.1e-02}$   | $8.76e - 01_{3.4e-03}$   | $9.78e - 01_{1.8e-01}$   | $9.26e - 01_{1.3e-02}$   | $9.60e - 01_{8.7e - 02}$ |
|   | $WFG3_5$            | $1.29e - 01_{2.5e-02}$   | $0.00e + 00_{0.0e+00}$   | $0.00e + 00_{1.4e-04}$   | $4.20e - 03_{1.1e-02}$   | $1.27e - 01_{6.8e-03}$   | $1.64e - 01_{1.0e - 02}$ | $1.48e - 01_{2.8e-03}$   |
|   | $WFG5\_5$           | $4.44e - 01_{2.4e-02}$   | $4.32e - 01_{3.3e-02}$   | $5.08e - 01_{1.6e-02}$   | $5.47e - 01_{4.6e-03}$   | $5.70e - 01_{1.1e-01}$   | $6.00e - 01_{5.4e-03}$   | $5.54e - 01_{2.2e-02}$   |
|   | $WFG4_5$            | $3.49e - 01_{1.7e-02}$   | $3.31e - 01_{1.8e-02}$   | $2.89e - 01_{4.1e-02}$   | $4.67e - 01_{4.4e-03}$   | $5.18e - 01_{7.3e-03}$   | $5.16e - 01_{1.0e-02}$   | $4.92e - 01_{2.2e-02}$   |
|   | $WFG6\_5$           | $3.88e - 01_{1.9e-02}$   | $4.08e - 01_{2.8e - 02}$ | $4.55e - 01_{3.5e - 02}$ | $5.51e - 01_{1.2e - 02}$ | $5.58e - 01_{4.4e-02}$   | $5.95e - 01_{2.0e - 02}$ | $5.67e - 01_{1.0e - 02}$ |
|   | $WFG7\_5$           | $3.03e - 01_{4.9e - 02}$ | $2.21e - 01_{6.3e - 02}$ | $2.55e - 01_{4.6e - 02}$ | $4.75e - 01_{6.4e - 03}$ | $5.32e - 01_{8.0e - 03}$ | $5.28e - 01_{2.4e-03}$   | $5.07e - 01_{8.0e - 02}$ |
|   | $WFG8_{-5}$         | $3.39e - 01_{2.8e-02}$   | $2.89e - 01_{2.2e-02}$   | $2.95e - 01_{7.6e - 02}$ | $4.75e - 01_{2.4e-03}$   | $5.00e - 01_{1.3e-02}$   | $4.96e - 01_{4.4e-03}$   | $3.58e - 01_{1.9e-02}$   |
|   | WFG9 <sub>-</sub> 5 | $3.87e - 01_{1.7e - 02}$ | $4.09e - 01_{8.1e-02}$   | $4.97e - 01_{4.8e-02}$   | $5.44e - 01_{1.9e-02}$   | $5.39e - 01_{4.1e-02}$   | $5.21e - 01_{1.4e-02}$   | $3.47e - 01_{2.0e - 02}$ |

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|   |             |                          | Tab                      | ole 3: IGD+. Mea         | an and Standard          | Deviation                |                          |                          |
|---|-------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   |             | NSGAII                   | SPEA2                    | MOEADDRA                 | MOEADD                   | AGE-MOEA-II              | ESPEA                    | GWASFGA                  |
|   | WFG1_2      | $3.84e - 02_{1.5e-02}$   | $1.10e - 01_{8.5e-02}$   | $3.04e - 01_{4.1e-02}$   | $1.12e - 01_{7.5e-02}$   | $4.48e - 02_{1.6e-02}$   | $1.32e - 01_{6.4e-02}$   | $2.68e - 02_{5.8e-03}$   |
|   | $WFG2_2$    | $7.32e - 03_{4.4e-03}$   | $2.82e - 03_{3.7e-04}$   | $1.69e - 02_{2.7e-03}$   | $9.07e - 03_{2.6e-03}$   | $9.35e - 03_{3.3e-03}$   | $8.39e - 03_{4.2e-03}$   | $9.34e - 03_{3.3e-03}$   |
|   | $WFG3_2$    | $2.24e - 02_{2.4e-04}$   | $2.19e - 02_{2.7e-04}$   | $2.20e - 02_{1.6e-04}$   | $2.14e - 02_{2.2e-04}$   | $2.14e - 02_{2.0e-04}$   | $2.25e - 02_{8.0e-04}$   | $2.20e - 02_{3.1e-04}$   |
|   | $WFG5_2$    | $2.78e - 02_{4.7e-05}$   | $2.76e - 02_{9.5e-05}$   | $2.84e - 02_{1.1e-03}$   | $2.74e - 02_{5.3e-05}$   | $2.83e - 02_{1.4e-03}$   | $2.71e - 02_{2.3e-05}$   | $2.75e - 02_{5.9e-05}$   |
|   | $WFG4_2$    | $4.01e - 03_{4.1e-04}$   | $3.92e - 03_{2.1e-04}$   | $2.18e - 02_{9.8e-04}$   | $3.60e - 03_{1.1e-04}$   | $2.60e - 03_{1.1e-04}$   | $2.76e - 03_{1.9e-04}$   | $3.67e - 03_{1.6e-04}$   |
|   | $WFG6_2$    | $2.17e - 02_{5.9e-03}$   | $2.18e - 02_{2.9e-03}$   | $4.36e - 02_{1.1e-02}$   | $2.25e - 02_{3.0e-03}$   | $2.16e - 02_{5.5e-03}$   | $2.06e - 02_{2.8e-03}$   | $2.27e - 02_{2.0e-03}$   |
|   | $WFG7_2$    | $4.02e - 03_{2.0e-04}$   | $3.43e - 03_{2.1e-04}$   | $5.90e - 03_{2.3e-04}$   | $3.46e - 03_{1.4e-05}$   | $2.73e - 03_{1.6e-04}$   | $2.85e - 03_{6.0e-05}$   | $3.80e - 03_{6.1e-05}$   |
|   | $WFG8_2$    | $2.80e - 02_{7.8e-04}$   | $2.71e - 02_{3.6e-04}$   | $3.20e - 02_{1.4e-03}$   | $2.52e - 02_{1.4e-03}$   | $2.57e - 02_{5.0e-04}$   | $2.52e - 02_{1.3e-03}$   | $2.75e - 02_{3.9e-04}$   |
|   | $WFG9_{-2}$ | $1.63e - 02_{2.1e-02}$   | $3.46e - 02_{2.7e-02}$   | $3.75e - 02_{2.3e-02}$   | $1.67e - 02_{2.1e-02}$   | $4.44e - 02_{2.1e-02}$   | $1.13e - 02_{4.8e-03}$   | $3.51e - 02_{2.6e-02}$   |
|   | $WFG1_3$    | $3.80e - 01_{1.1e-01}$   | $3.62e - 01_{8.8e-02}$   | $5.09e - 01_{1.1e-02}$   | $3.48e - 01_{9.8e-02}$   | $1.82e - 01_{1.1e-01}$   | $6.53e - 02_{3.1e-02}$   | $1.84e - 01_{1.2e-01}$   |
|   | $WFG2_3$    | $4.50e - 02_{8.7e-03}$   | $3.12e - 02_{2.5e-03}$   | $1.34e - 01_{2.8e-02}$   | $5.23e - 02_{7.4e-03}$   | $2.26e - 02_{4.7e-03}$   | $2.57e - 02_{7.6e-04}$   | $3.46e - 02_{3.6e-03}$   |
| 4 | $WFG3_{-3}$ | $4.66e - 02_{1.1e-02}$   | $6.15e - 02_{9.5e-03}$   | $5.42e - 02_{8.2e-03}$   | $9.14e - 02_{9.9e-03}$   | $4.23e - 02_{1.3e-02}$   | $3.06e - 02_{7.7e-03}$   | $2.85e - 02_{6.4e-03}$   |
| " | $WFG5\_3$   | $5.28e - 02_{2.4e-03}$   | $5.20e - 02_{4.8e-03}$   | $5.46e - 02_{1.6e-03}$   | $4.96e - 02_{1.2e-03}$   | $5.23e - 02_{1.0e-02}$   | $4.57e - 02_{1.2e-03}$   | $4.87e - 02_{9.3e-04}$   |
|   | $WFG4\_3$   | $3.95e - 02_{3.0e-03}$   | $4.56e - 02_{3.3e-03}$   | $6.07e - 02_{3.5e - 03}$ | $3.37e - 02_{2.9e-03}$   | $2.79e - 02_{1.8e - 03}$ | $2.62e - 02_{1.7e - 03}$ | $2.81e - 02_{2.7e-03}$   |
|   | $WFG6_3$    | $5.71e - 02_{5.8e-03}$   | $5.28e - 02_{3.1e-03}$   | $6.62e - 02_{3.2e-03}$   | $4.83e - 02_{6.0e-03}$   | $4.70e - 02_{1.8e-03}$   | $4.35e - 02_{3.4e-03}$   | $4.49e - 02_{2.1e-03}$   |
|   | $WFG7_{-3}$ | $3.85e - 02_{2.6e-03}$   | $3.73e - 02_{6.0e-03}$   | $5.57e - 02_{1.0e-02}$   | $3.21e - 02_{2.8e-03}$   | $2.55e - 02_{1.4e-03}$   | $3.03e - 02_{9.0e-04}$   | $3.01e - 02_{2.1e-03}$   |
|   | $WFG8\_3$   | $8.02e - 02_{3.6e-03}$   | $7.39e - 02_{2.6e-03}$   | $1.08e - 01_{1.7e-02}$   | $6.83e - 02_{3.8e-03}$   | $6.58e - 02_{2.4e-03}$   | $7.11e - 02_{2.9e-03}$   | $6.82e - 02_{2.3e-03}$   |
|   | $WFG9\_3$   | $6.51e - 02_{2.4e-03}$   | $5.68e - 02_{7.9e-03}$   | $6.37e - 02_{1.3e-03}$   | $5.29e - 02_{9.3e-03}$   | $4.70e - 02_{1.2e - 02}$ | $5.65e - 02_{8.0e-03}$   | $6.54e - 02_{4.8e-04}$   |
|   | $WFG1_5$    | $6.58e - 01_{6.1e-02}$   | $8.65e - 01_{4.4e-02}$   | $4.82e - 01_{9.3e-02}$   | $3.63e - 01_{3.0e-02}$   | $2.85e - 01_{4.3e-02}$   | $1.15e - 01_{1.6e-02}$   | $1.20e - 01_{2.3e-02}$   |
|   | $WFG2_{-5}$ | $1.83e - 01_{1.5e-02}$   | $1.89e - 01_{1.2e-02}$   | $8.72e - 02_{3.8e-02}$   | $6.63e - 02_{2.0e-03}$   | $9.59e - 02_{4.4e-02}$   | $1.67e - 01_{1.2e-02}$   | $9.45e - 02_{3.1e-02}$   |
|   | $WFG3_5$    | $2.00e - 01_{2.3e-02}$   | $7.94e - 01_{9.5e - 02}$ | $5.60e - 01_{9.3e-02}$   | $3.87e - 01_{8.6e-02}$   | $7.38e - 02_{3.2e-03}$   | $3.96e - 02_{6.6e-03}$   | $2.02e - 01_{2.9e-03}$   |
|   | $WFG5\_5$   | $1.43e - 01_{1.0e-02}$   | $1.50e - 01_{1.4e-02}$   | $7.90e - 02_{3.4e-03}$   | $6.25e - 02_{9.5e-04}$   | $8.48e - 02_{9.8e-03}$   | $7.72e - 02_{1.6e - 03}$ | $9.03e - 02_{5.4e-03}$   |
|   | $WFG4_5$    | $1.37e - 01_{9.9e - 03}$ | $1.67e - 01_{5.3e - 03}$ | $1.63e - 01_{1.2e-02}$   | $9.35e - 02_{2.8e-03}$   | $8.93e - 02_{6.0e-03}$   | $1.09e - 01_{3.3e-03}$   | $1.09e - 01_{8.4e - 03}$ |
|   | $WFG6_{-5}$ | $1.61e - 01_{1.2e-02}$   | $1.56e - 01_{7.6e-03}$   | $9.94e - 02_{5.4e-03}$   | $5.95e - 02_{2.4e-03}$   | $7.80e - 02_{3.2e-03}$   | $7.46e - 02_{4.7e-03}$   | $8.02e - 02_{4.2e-03}$   |
|   | $WFG7\_5$   | $1.73e - 01_{1.9e - 02}$ | $2.13e - 01_{1.8e - 02}$ | $1.68e - 01_{1.7e-02}$   | $7.87e - 02_{1.2e-03}$   | $8.67e - 02_{3.3e-03}$   | $1.10e - 01_{2.1e-03}$   | $1.49e - 01_{6.3e-02}$   |
|   | $WFG8\_5$   | $3.32e - 01_{9.4e-03}$   | $2.76e - 01_{4.3e - 03}$ | $2.18e - 01_{1.8e - 02}$ | $1.52e - 01_{1.3e - 03}$ | $1.73e - 01_{2.6e-03}$   | $1.98e - 01_{7.4e-03}$   | $3.16e - 01_{1.1e-02}$   |
|   | WFG9_5      | $1.58e - 01_{1.1e-02}$   | $1.67e - 01_{3.2e-02}$   | $8.28e - 02_{1.1e-02}$   | $6.20e - 02_{3.7e-03}$   | $8.83e - 02_{1.4e-02}$   | $9.83e - 02_{4.3e-03}$   | $1.54e - 01_{7.0e-03}$   |

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| Table 4: IGD+. Median and Interquartile Range |                          |                          |                          |                          |                          |                        |                          |  |  |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------------------|--------------------------|--|--|
|   | NSGAII                   | SPEA2                    | MOEADDRA                 | MOEADD                   | AGE-MOEA-II              | ESPEA                  | GWASFGA                  |  |  |
| WFG1_2  | $2.89e - 02_{2.8e-02}$   | $7.19e - 02_{1.6e-01}$   | $3.28e - 01_{7.3e-02}$   | $7.29e - 02_{1.4e-01}$   | $4.72e - 02_{2.9e-02}$   | $1.16e - 01_{9.0e-02}$ | $2.67e - 02_{9.7e-03}$   |  |  |
| $WFG2_2$                                      | $1.05e - 02_{8.1e-03}$   | $2.73e - 03_{6.8e-04}$   | $1.54e - 02_{4.8e-03}$   | $9.89e - 03_{3.8e-03}$   | $1.09e - 02_{4.4e-03}$   | $1.01e - 02_{8.1e-03}$ | $1.08e - 02_{4.3e-03}$   |  |  |
| $WFG3_2$                                      | $2.22e - 02_{4.6e-04}$   | $2.19e - 02_{4.3e-04}$   | $2.19e - 02_{2.9e-04}$   | $2.14e - 02_{4.3e-04}$   | $2.13e - 02_{3.7e-04}$   | $2.22e - 02_{1.5e-03}$ | $2.20e - 02_{5.8e-04}$   |  |  |
| $WFG5_2$                                      | $2.78e - 02_{6.1e-05}$   | $2.76e - 02_{1.4e-04}$   | $2.79e - 02_{1.9e-03}$   | $2.74e - 02_{6.5e-05}$   | $2.75e - 02_{2.1e-03}$   | $2.71e - 02_{3.9e-05}$ | $2.75e - 02_{1.1e-04}$   |  |  |
| $WFG4_2$                                      | $3.97e - 03_{7.2e-04}$   | $3.85e - 03_{4.0e-04}$   | $2.20e - 02_{1.7e-03}$   | $3.55e - 03_{1.7e-04}$   | $2.60e - 03_{2.0e-04}$   | $2.64e - 03_{3.5e-04}$ | $3.68e - 03_{3.0e-04}$   |  |  |
| $WFG6_2$                                      | $2.31e - 02_{8.8e-03}$   | $2.12e - 02_{5.6e-03}$   | $4.87e - 02_{1.3e-02}$   | $2.09e - 02_{5.6e-03}$   | $2.32e - 02_{7.6e-03}$   | $2.15e - 02_{5.1e-03}$ | $2.23e - 02_{3.6e-03}$   |  |  |
| $WFG7_{-2}$                                   | $4.09e - 03_{3.7e-04}$   | $3.49e - 03_{3.9e-04}$   | $6.02e - 03_{3.2e-04}$   | $3.46e - 03_{2.4e-05}$   | $2.64e - 03_{2.9e-04}$   | $2.87e - 03_{1.0e-04}$ | $3.78e - 03_{1.1e-04}$   |  |  |
| $WFG8_2$                                      | $2.81e - 02_{1.2e-03}$   | $2.69e - 02_{6.7e-04}$   | $3.25e - 02_{2.6e-03}$   | $2.52e - 02_{2.7e-03}$   | $2.56e - 02_{8.2e-04}$   | $2.52e - 02_{2.6e-03}$ | $2.77e - 02_{7.1e-04}$   |  |  |
| $WFG9_2$                                      | $6.55e - 03_{2.5e - 02}$ | $5.40e - 02_{4.9e-02}$   | $5.39e - 02_{4.1e-02}$   | $8.07e - 03_{2.6e-02}$   | $5.40e - 02_{2.4e-02}$   | $1.05e - 02_{8.3e-03}$ | $5.41e - 02_{4.8e - 02}$ |  |  |
| $WFG1_3$                                      | $4.26e - 01_{1.6e-01}$   | $3.68e - 01_{1.5e-01}$   | $5.13e - 01_{1.5e - 02}$ | $3.63e - 01_{1.6e-01}$   | $2.46e - 01_{2.1e-01}$   | $8.01e - 02_{5.9e-02}$ | $2.19e - 01_{2.3e-01}$   |  |  |
| $WFG2_{-3}$                                   | $4.63e - 02_{1.6e-02}$   | $3.06e - 02_{3.7e-03}$   | $1.24e - 01_{4.4e-02}$   | $5.64e - 02_{1.3e-02}$   | $2.31e - 02_{6.8e-03}$   | $2.54e - 02_{1.5e-03}$ | $3.38e - 02_{5.5e-03}$   |  |  |
| $WFG3_3$                                      | $4.35e - 02_{1.8e-02}$   | $6.06e - 02_{1.7e-02}$   | $5.12e - 02_{1.5e-02}$   | $9.36e - 02_{1.9e-02}$   | $4.17e - 02_{2.3e-02}$   | $3.04e - 02_{1.3e-02}$ | $2.67e - 02_{9.0e-03}$   |  |  |
| $WFG5_3$                                      | $5.17e - 02_{4.4e-03}$   | $5.10e - 02_{8.9e-03}$   | $5.52e - 02_{2.4e - 03}$ | $5.01e - 02_{2.1e-03}$   | $4.83e - 02_{1.2e - 02}$ | $4.62e - 02_{1.8e-03}$ | $4.91e - 02_{1.8e-03}$   |  |  |
| $WFG4_3$                                      | $4.06e - 02_{5.2e-03}$   | $4.64e - 02_{5.8e-03}$   | $6.07e - 02_{6.2e - 03}$ | $3.49e - 02_{4.2e-03}$   | $2.80e - 02_{2.9e-03}$   | $2.58e - 02_{3.1e-03}$ | $2.78e - 02_{4.8e-03}$   |  |  |
| $WFG6_{-3}$                                   | $5.86e - 02_{1.0e-02}$   | $5.21e - 02_{5.6e-03}$   | $6.80e - 02_{6.1e-03}$   | $4.69e - 02_{1.0e-02}$   | $4.67e - 02_{3.4e-03}$   | $4.36e - 02_{6.6e-03}$ | $4.49e - 02_{3.4e-03}$   |  |  |
| $WFG7_3$                                      | $3.87e - 02_{4.9e-03}$   | $3.65e - 02_{1.0e-02}$   | $5.86e - 02_{2.0e-02}$   | $3.35e - 02_{5.3e-03}$   | $2.53e - 02_{2.4e - 03}$ | $3.02e - 02_{1.6e-03}$ | $2.95e - 02_{3.3e-03}$   |  |  |
| $WFG8_3$                                      | $8.09e - 02_{7.0e-03}$   | $7.39e - 02_{5.1e-03}$   | $1.13e - 01_{3.0e - 02}$ | $7.04e - 02_{6.4e-03}$   | $6.69e - 02_{4.5e-03}$   | $7.04e - 02_{5.3e-03}$ | $6.83e - 02_{4.4e-03}$   |  |  |
| $WFG9_{-3}$                                   | $6.50e - 02_{4.5e-03}$   | $5.96e - 02_{1.4e-02}$   | $6.32e - 02_{2.3e-03}$   | $4.88e - 02_{1.8e-02}$   | $5.56e - 02_{2.3e-02}$   | $5.96e - 02_{9.9e-03}$ | $6.55e - 02_{9.4e-04}$   |  |  |
| $WFG1_{-5}$                                   | $6.84e - 01_{1.1e-01}$   | $8.44e - 01_{6.7e-02}$   | $4.46e - 01_{1.5e-01}$   | $3.71e - 01_{4.8e-02}$   | $2.82e - 01_{8.4e-02}$   | $1.10e - 01_{2.5e-02}$ | $1.12e - 01_{4.2e-02}$   |  |  |
| $WFG2_5$                                      | $1.87e - 01_{2.3e - 02}$ | $1.87e - 01_{2.2e-02}$   | $7.07e - 02_{4.6e - 02}$ | $6.66e - 02_{3.9e-03}$   | $6.56e - 02_{8.1e-02}$   | $1.65e - 01_{2.3e-02}$ | $8.10e - 02_{3.7e-02}$   |  |  |
| $WFG3_5$                                      | $1.96e - 01_{4.4e-02}$   | $8.33e - 01_{1.6e-01}$   | $5.85e - 01_{1.7e-01}$   | $4.18e - 01_{1.6e-01}$   | $7.56e - 02_{5.7e-03}$   | $3.51e - 02_{1.2e-02}$ | $2.02e - 01_{5.5e-03}$   |  |  |
| $WFG5_{-}5$                                   | $1.39e - 01_{1.3e-02}$   | $1.45e - 01_{1.8e-02}$   | $7.81e - 02_{5.3e-03}$   | $6.27e - 02_{1.8e-03}$   | $7.89e - 02_{1.8e-02}$   | $7.69e - 02_{2.4e-03}$ | $8.87e - 02_{7.6e-03}$   |  |  |
| $WFG4_5$                                      | $1.39e - 01_{1.9e-02}$   | $1.69e - 01_{9.6e-03}$   | $1.62e - 01_{2.2e-02}$   | $9.43e - 02_{4.6e-03}$   | $9.07e - 02_{1.1e-02}$   | $1.09e - 01_{6.4e-03}$ | $1.09e - 01_{1.5e-02}$   |  |  |
| $WFG6_5$                                      | $1.65e - 01_{2.3e-02}$   | $1.58e - 01_{1.5e-02}$   | $9.67e - 02_{9.5e-03}$   | $5.99e - 02_{3.8e-03}$   | $7.80e - 02_{5.6e-03}$   | $7.34e - 02_{9.1e-03}$ | $8.04e - 02_{8.0e-03}$   |  |  |
| $WFG7_{-}5$                                   | $1.76e - 01_{3.2e-02}$   | $2.17e - 01_{3.5e - 02}$ | $1.76e - 01_{3.2e - 02}$ | $7.83e - 02_{1.8e - 03}$ | $8.63e - 02_{6.4e-03}$   | $1.11e - 01_{3.8e-03}$ | $1.07e - 01_{1.1e-01}$   |  |  |
| $WFG8_{-5}$                                   | $3.29e - 01_{1.8e-02}$   | $2.75e - 01_{6.9e - 03}$ | $2.18e - 01_{3.2e-02}$   | $1.51e - 01_{2.3e - 03}$ | $1.72e - 01_{5.0e-03}$   | $2.01e - 01_{1.3e-02}$ | $3.11e - 01_{1.7e-02}$   |  |  |
| WFG9_5  | $1.62e - 01_{2.1e-02}$   | $1.60e - 01_{4.7e - 02}$ | $8.26e - 02_{2.1e-02}$   | $6.03e - 02_{5.9e - 03}$ | $9.31e - 02_{1.9e-02}$   | $9.76e - 02_{7.3e-03}$ | $1.51e - 01_{1.2e - 02}$ |  |  |