Walker Implementation Documentation

Run1 – 24 hrs (2 generations, 50 population, 100 robots/execution) => 9/01/25 to 11/01/25

Generation 1 same as Generation 2 (no change in morphology or PPO policy)

Evolutionary Robotics => mutation and improvement in fitness. Stopped.

Run2 – 10 hrs expected (2 generations, 5 population, 10 robots/ execution, simulation time = 2) 11/01/25

Changing mutation rate from 0.1 to 0.3 and changing crossover rate from 0.2 to 0.5

Modified the code (from run1 to run2) to share PPO policies across generations (best policy is shared). Also, modified the run.py code for run\_ppo function, to accommodate passing a trained model/ policy.

Modified the crossover and mutation part of the code to include more controlled operation rather than random changes. (changes as given in run2.py)

Output: Poor average fitness, too much mutation. Reduced the mutation rates. Significant drop in average fitness across generations but max fitness (of individual robots) has improved. Just that fitness is low. All other metrics look good.

Run3 – 120 hrs Expected (gen – 10, pop – 50, 500 robots/execution, simulation time - 5) 12/01/2025

Just modified the configurations and parameters value. Map\_res = 3, gen = 10, pop = 50, top\_n\_survive = 8, simul\_time = 5, mutation\_rate = 0.15, crossover\_rate = 0.3