

## Comparison results of additional baselines

The design automation of simulated soft robots is a relatively new research field. Existing methods generally fall into three categories, in each of which we include *both classic methods and latest SOTA ones* as our baselines. ❶ **Search strategies based on generative models** - CPPN-NEAT is a pioneer of this kind while roboGAN is a new SOTA method proposed in 2022. ❷ **EAs** - GA is an effective one that has long dominated various optimization problems, while SE is a latest modification of GA proposed in 2021. ❸ **EAs assisted with surrogate models** - the classic method BO, and two additional baselines (not presented in our paper due to space limit) which leverage Random Forests (RFEA, Sun et al., 2020) and Action Inheritance (AIEA, Liu et al., 2023) as surrogate models, respectively. The new comparison results are plotted in Figure 1(a,b,c) below, which still clearly showcase our superiority.

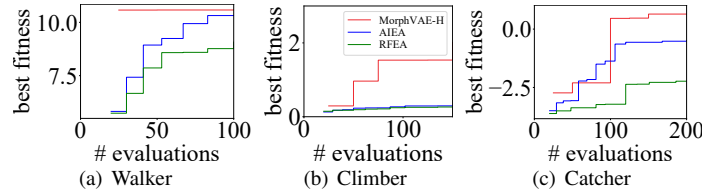


Figure 1: Performance comparison of maximal fitness

## References

- Liu, S., Yao, W., Wang, H., Peng, W., and Yang, Y. (2023). Rapidly evolving soft robots via action inheritance. *IEEE Transactions on Evolutionary Computation*, pages 1–1.
- Sun, Y., Wang, H., Xue, B., Jin, Y., Yen, G. G., and Zhang, M. (2020). Surrogate-assisted evolutionary deep learning using an end-to-end random forest-based performance predictor. *IEEE Transactions on Evolutionary Computation*, 24(2).