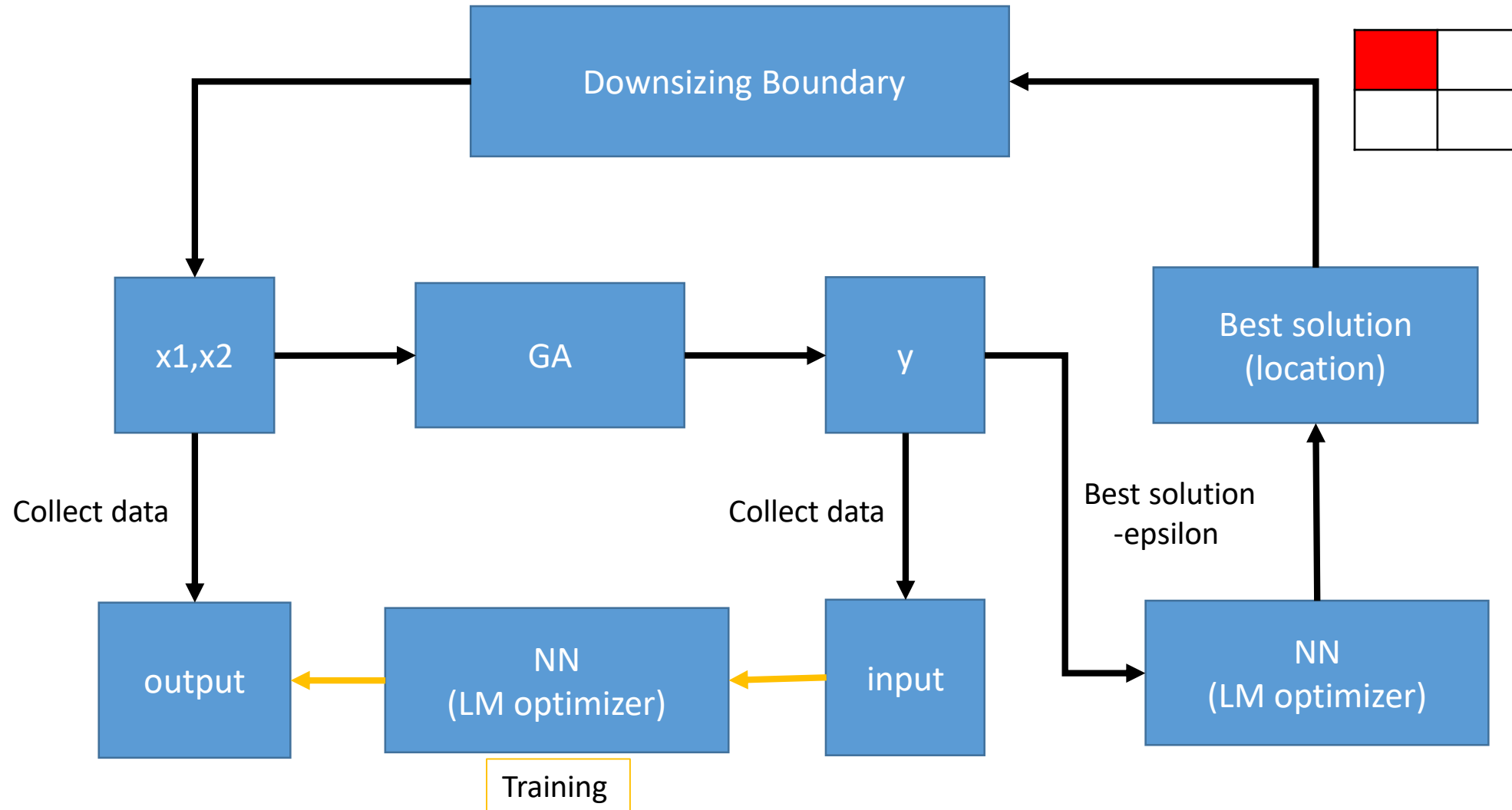


Demo

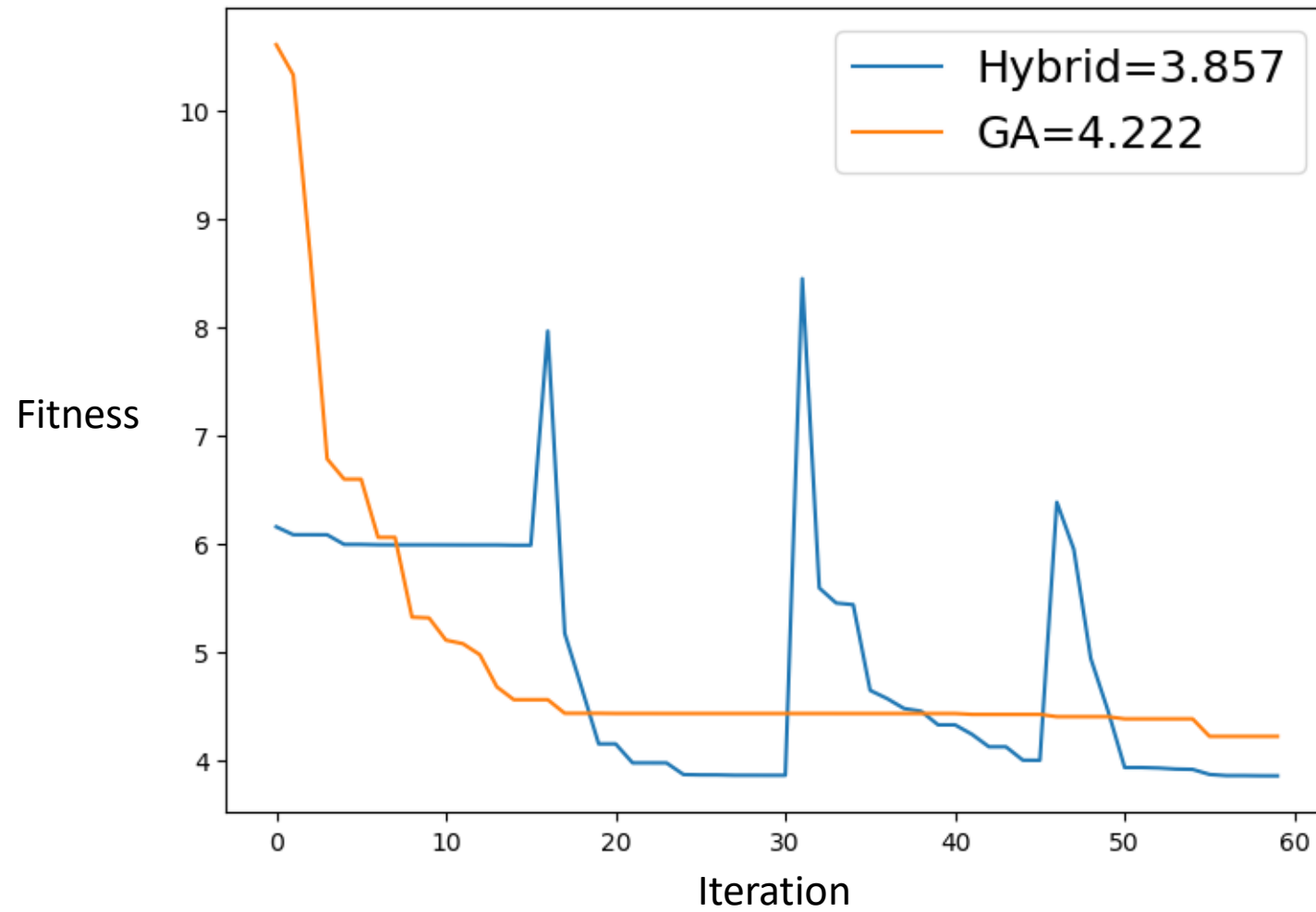
Software

- Neural network + Levenberg-Marquardt Algorithm : pyrenn
 - <https://pyrenn.readthedocs.io/en/latest/index.html>
- Genetic algorithm : scikit-opt
 - <https://github.com/guofei9987/scikit-opt>
- bayesian optimization with tree parzen estimator : hyperas
 - <https://github.com/maxpumperla/hyperas>

Hybrid (GA+NN+LM) workflow



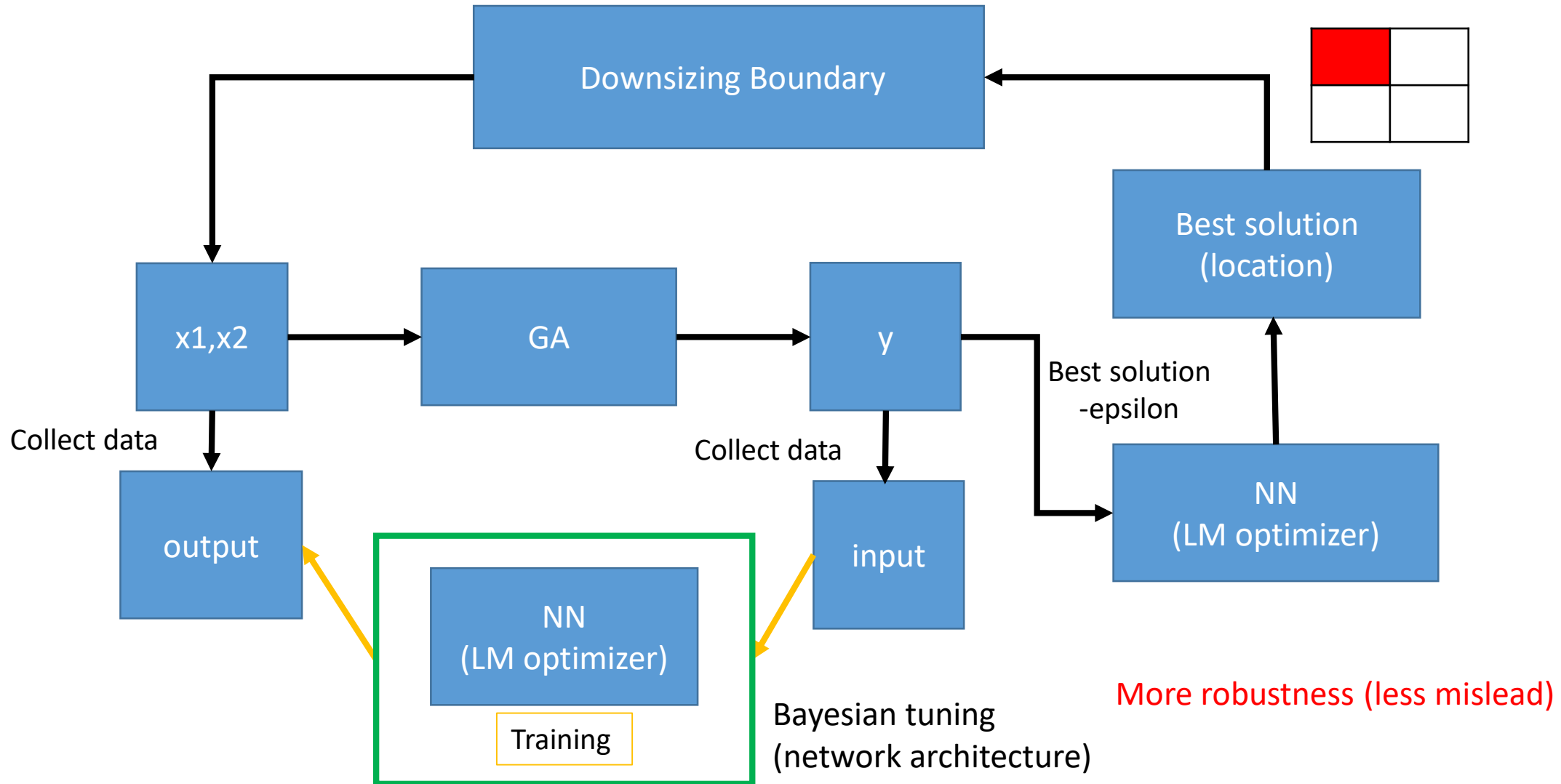
Result



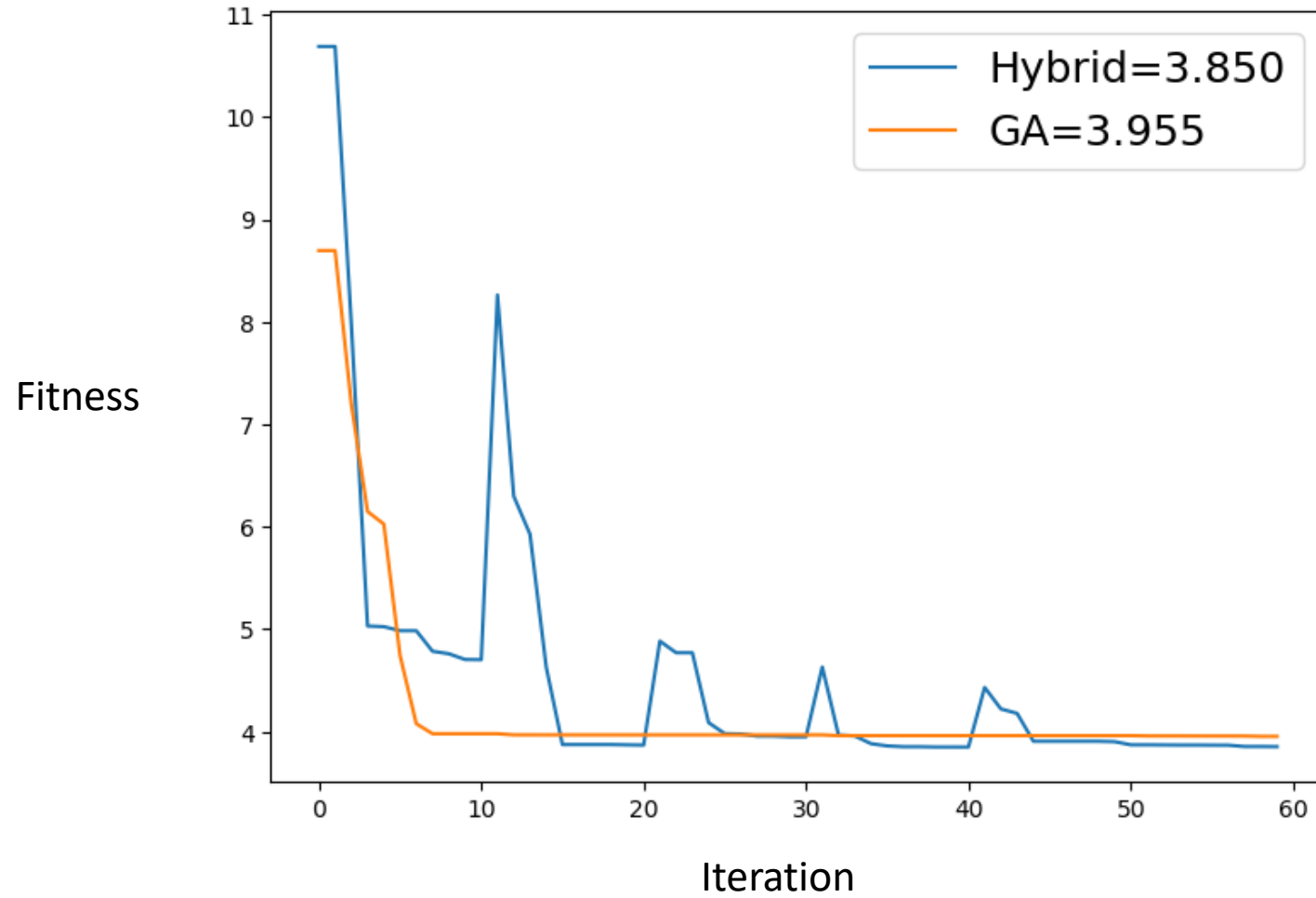
Result

<div>Methods</div> <div>Iterations</div>	GA	Hybrid
1	10.608	6.157
10	5.316	5.990
20	4.435	4.152
40	4.433	4.328
60	4.221	3.857

Hybrid (GA+NN+LM+bayesian) workflow



Result



Result

<div>Methods</div> <div>Iterations</div>	GA	Hybrid
1	8.696	10.608
10	3.980	4.705
20	3.968	3.950
40	3.961	3.850
60	3.954	3.854