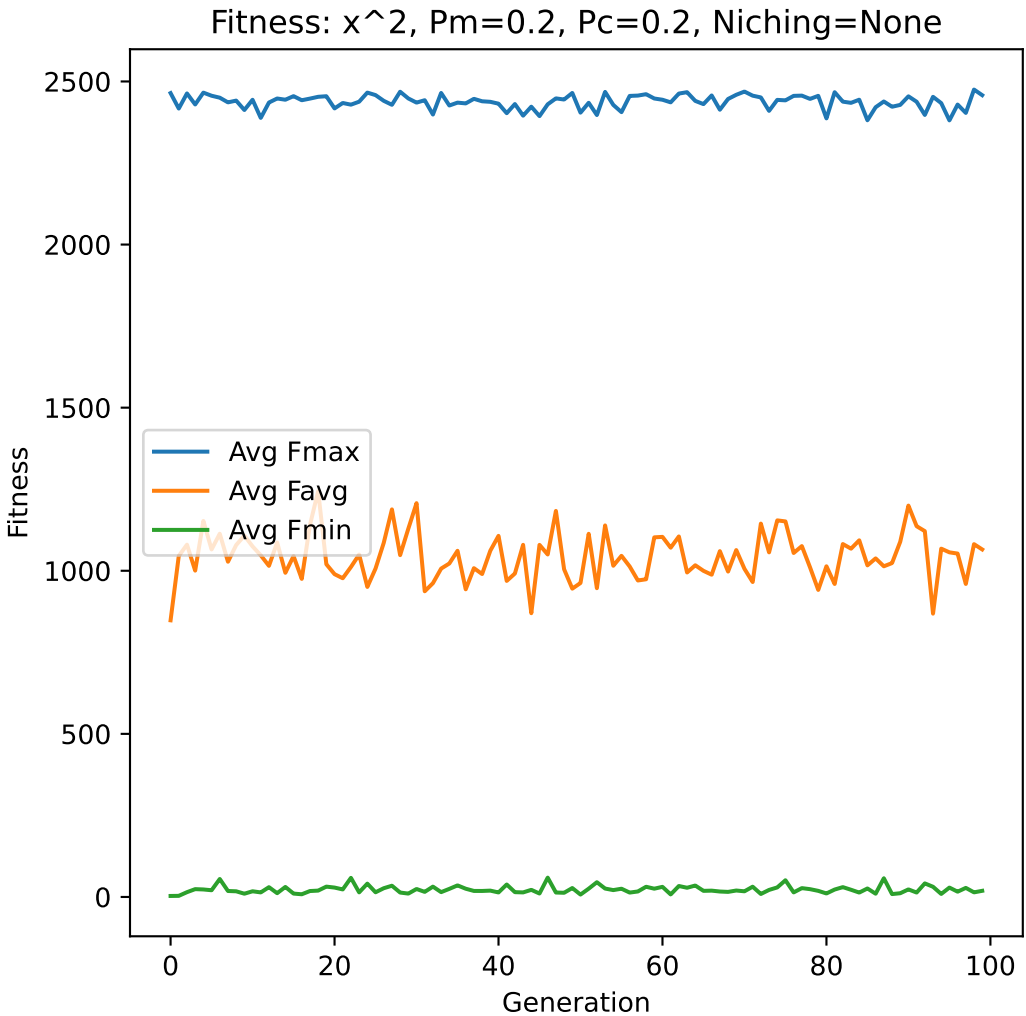
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2500
2000
1500
1000
500
0
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
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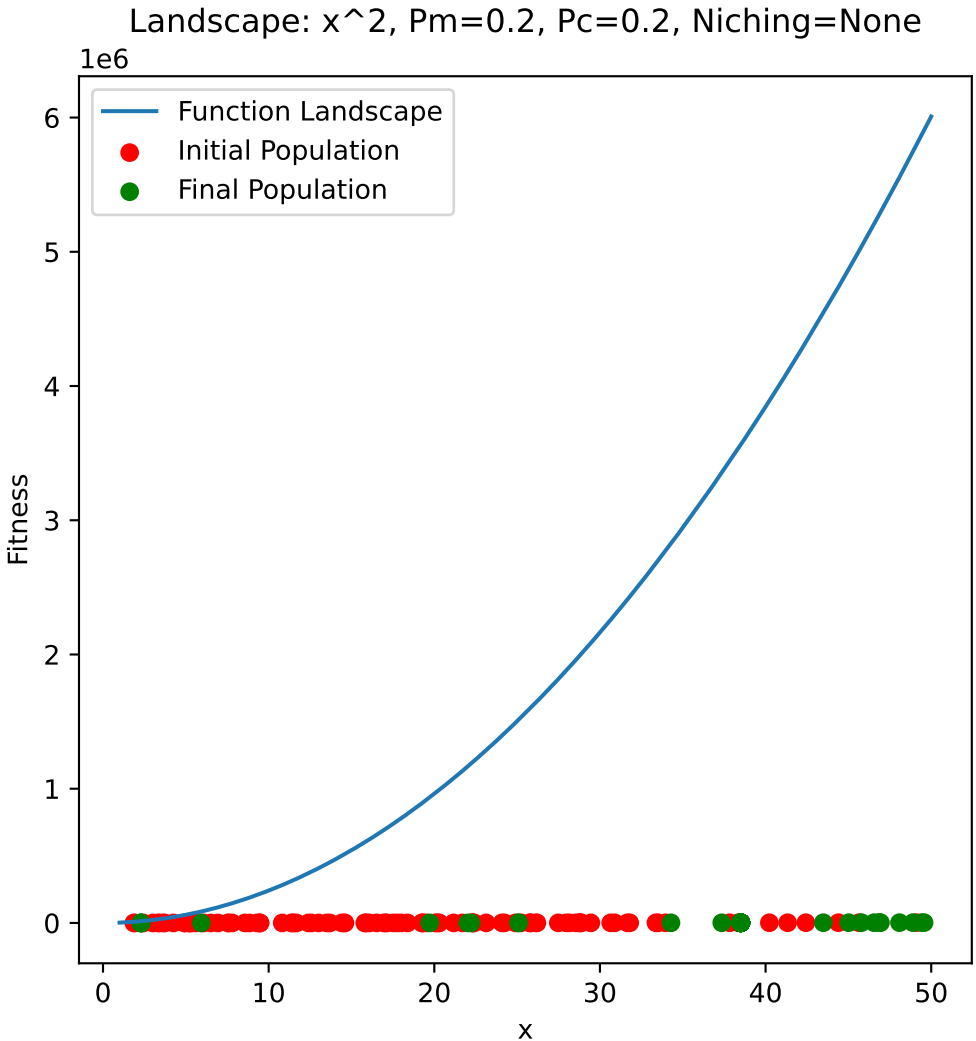
40
60
80
100
Generation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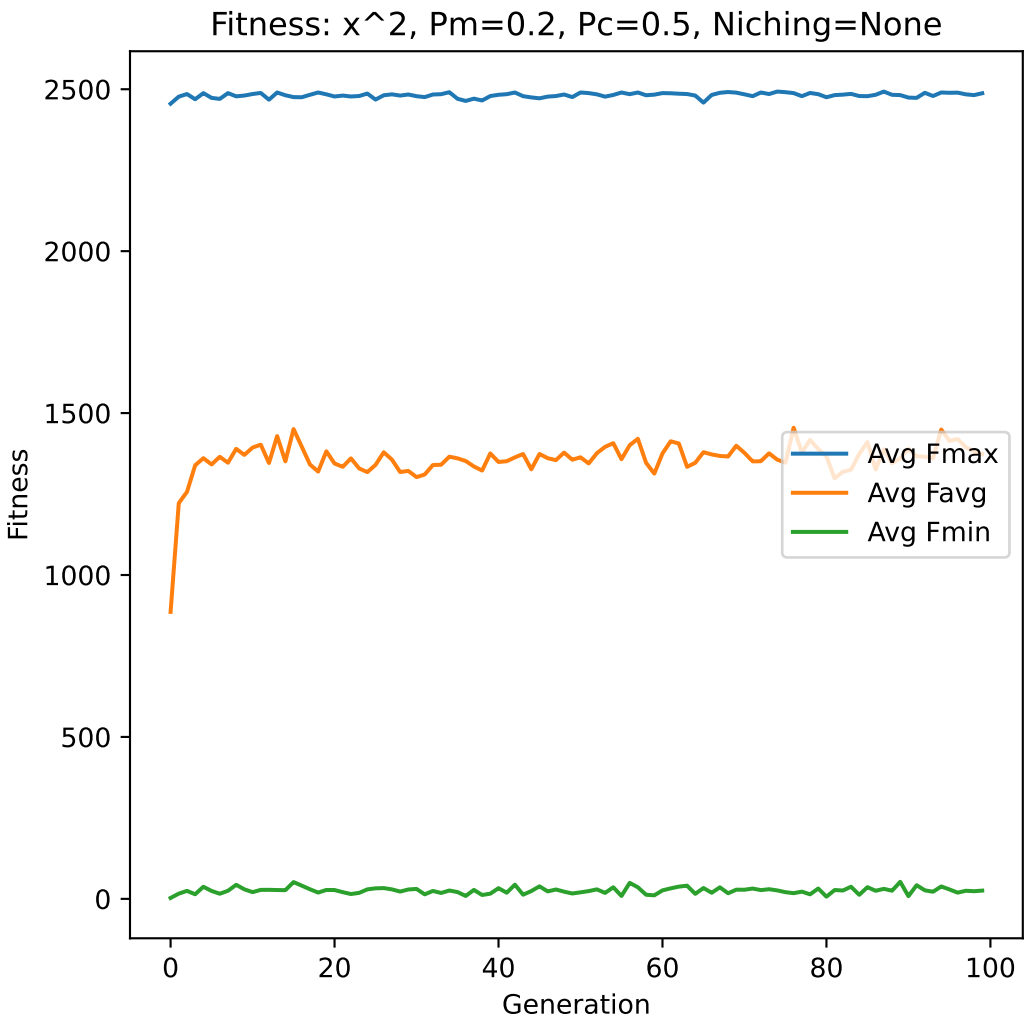
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
10
20
30
40
50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2000
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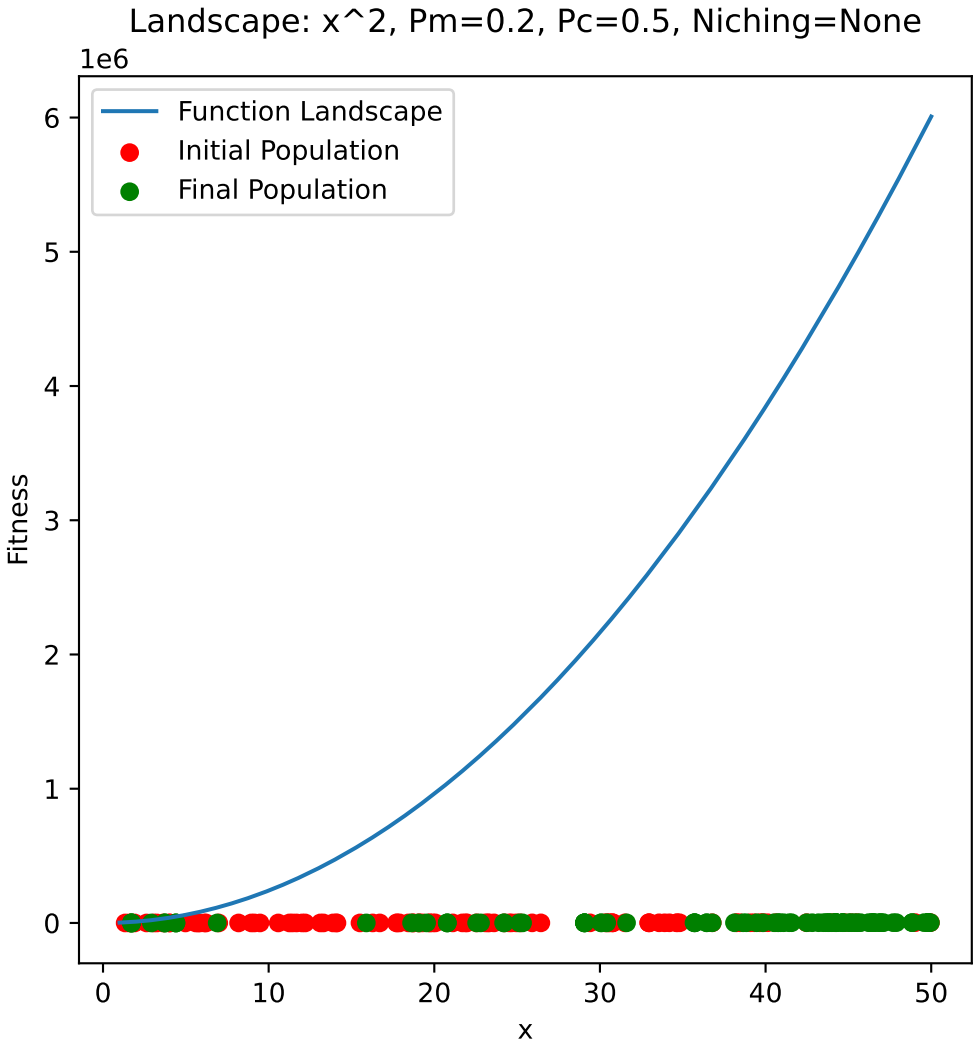
500
0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.2, Pc=0.5, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
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20
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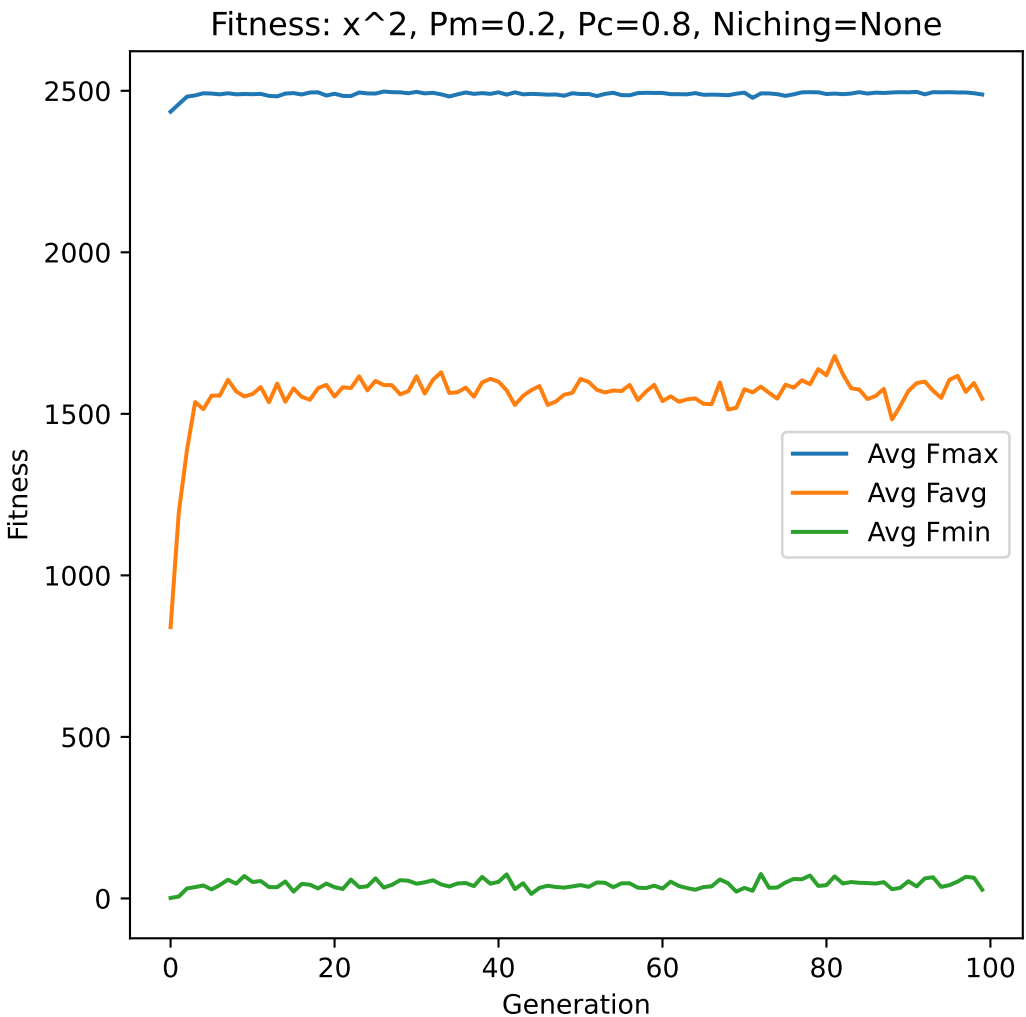
40
50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Fitness
0
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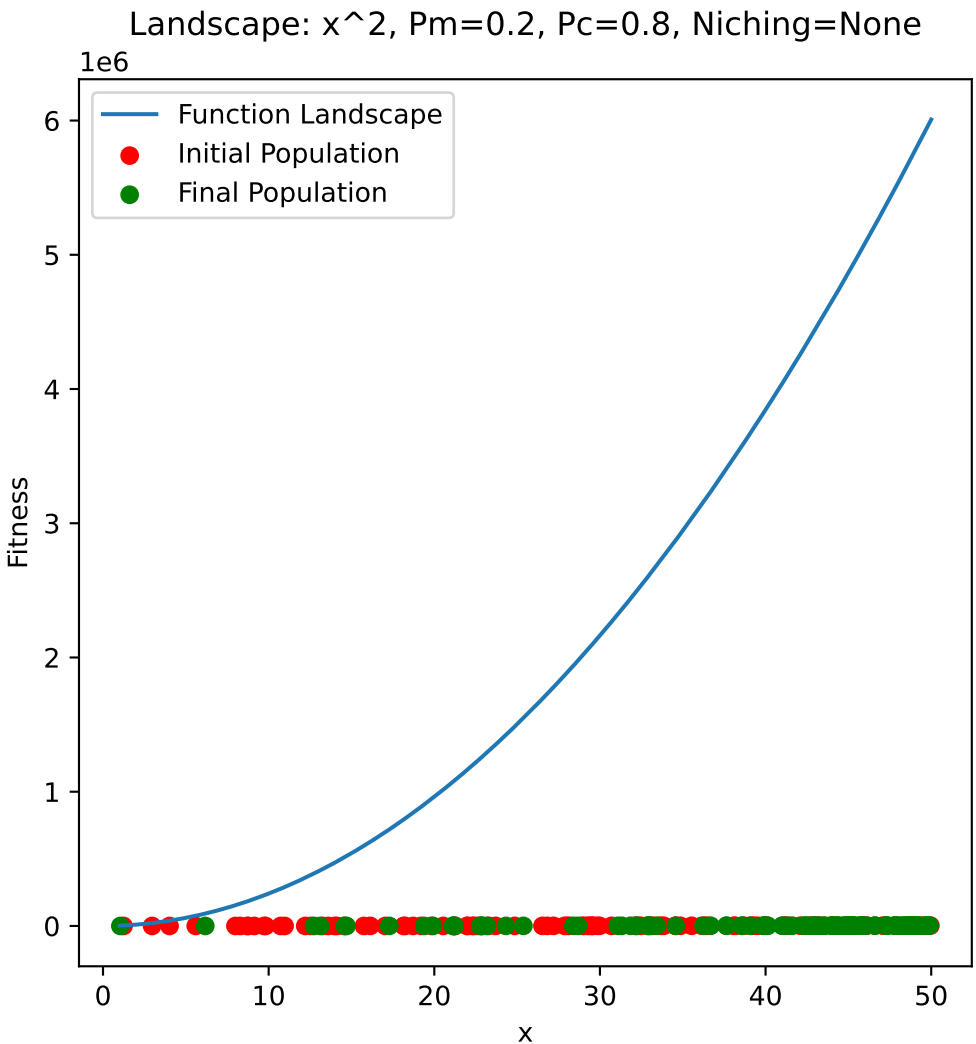
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.2, Pc=0.8, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
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20
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40
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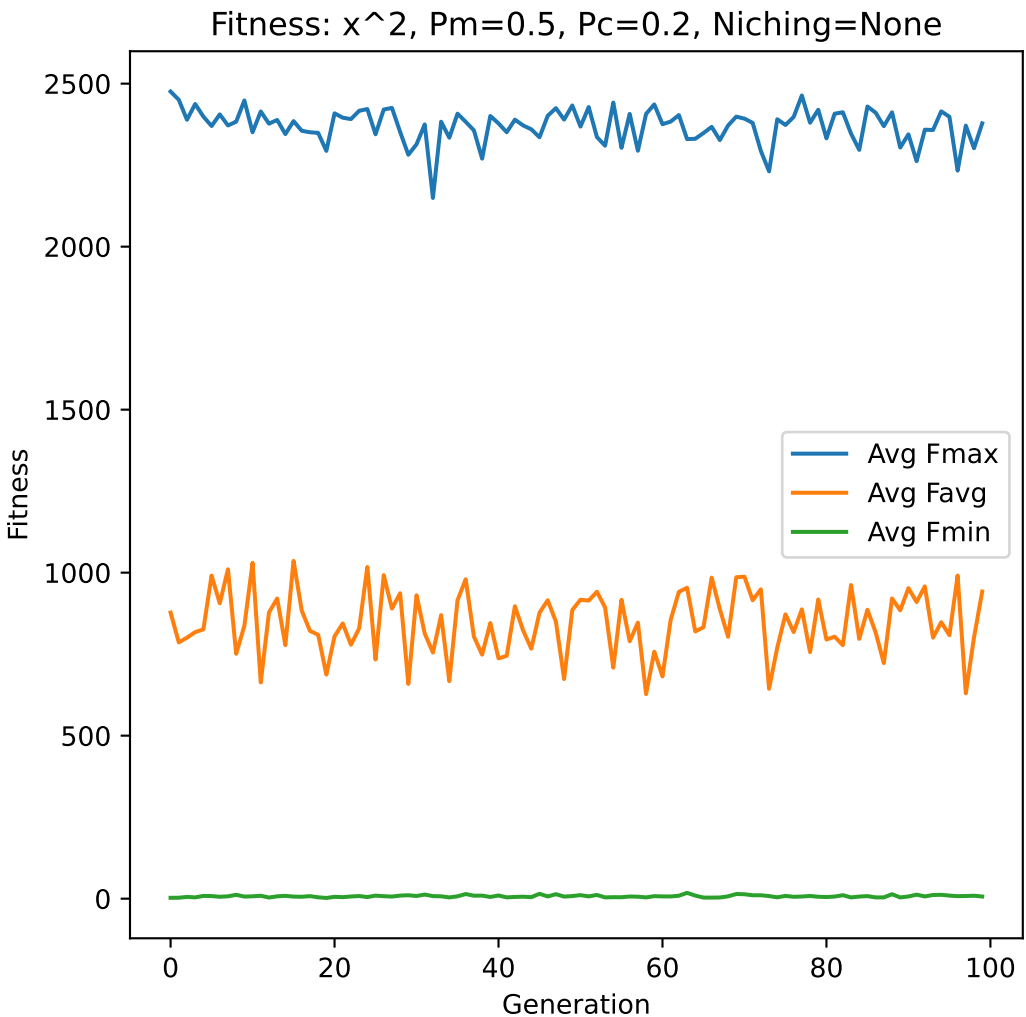
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Fitness
0
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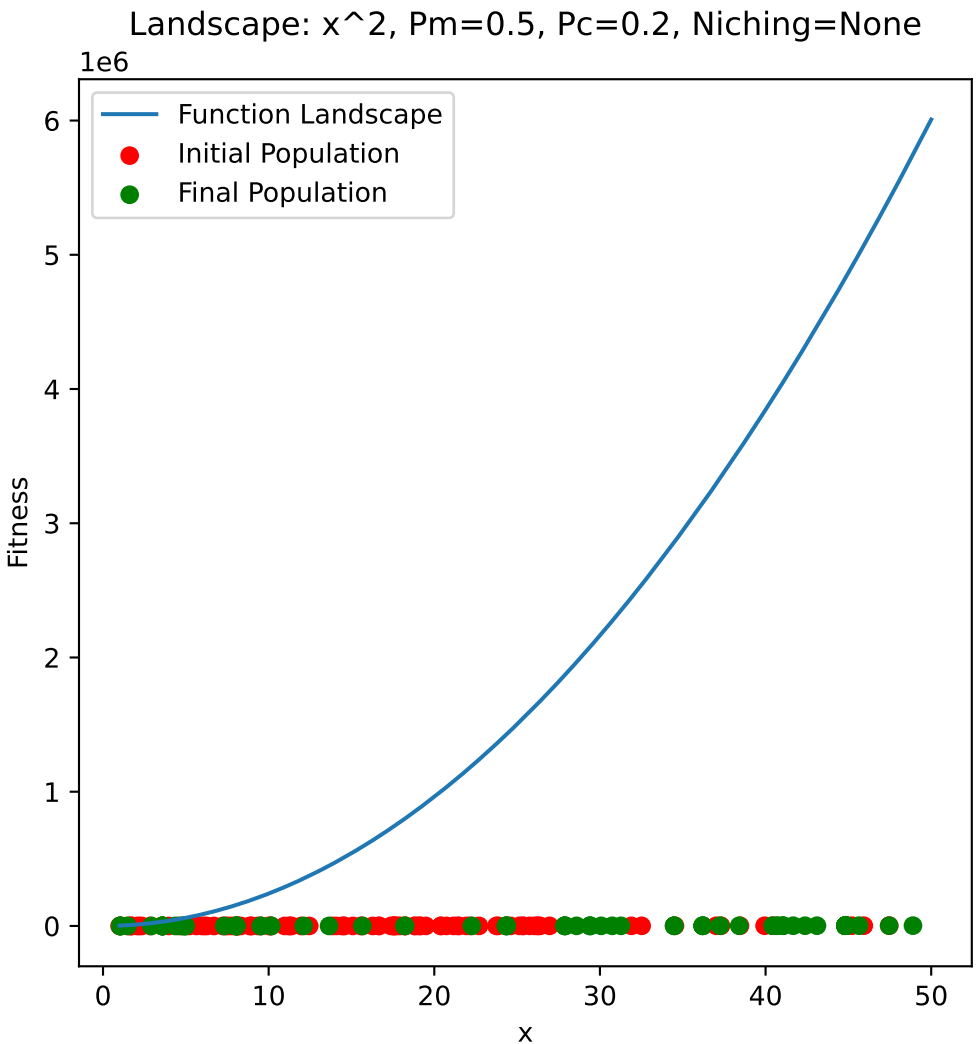
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.5, Pc=0.2, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
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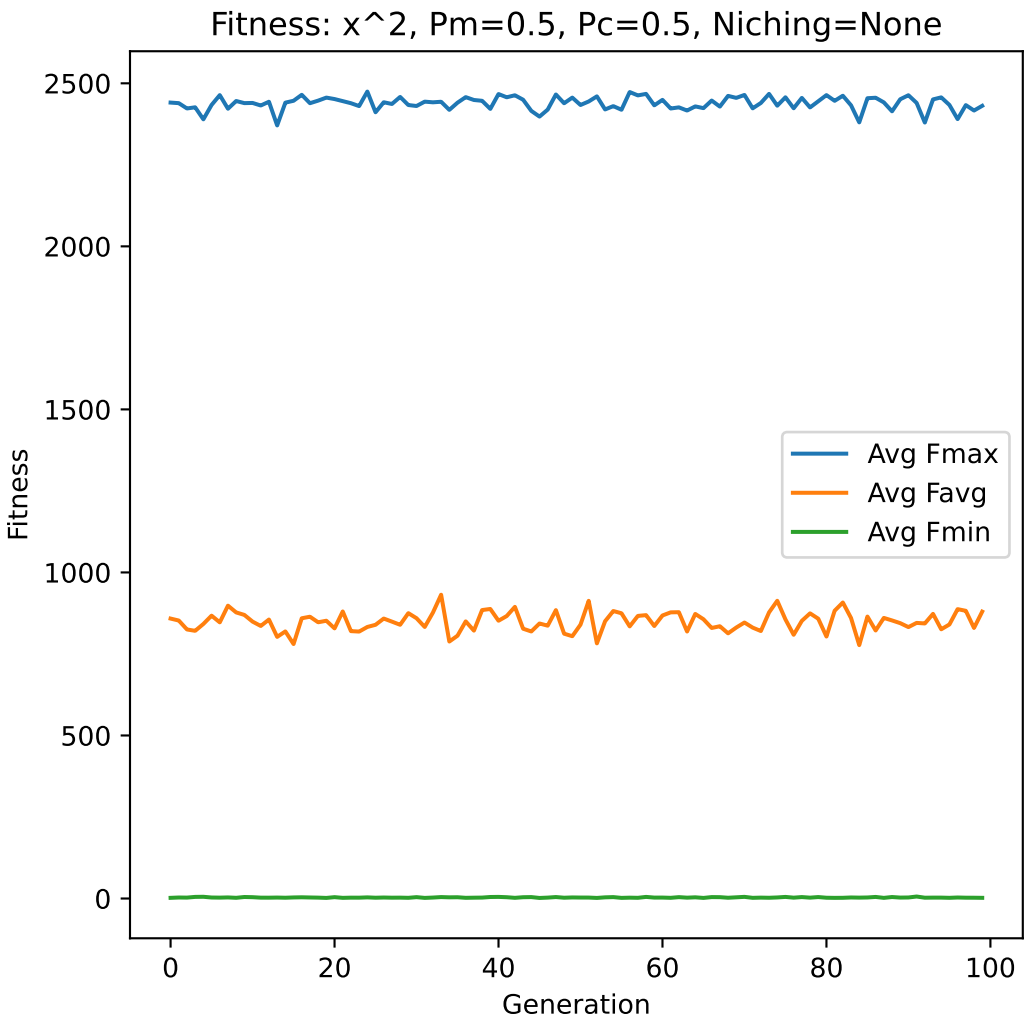
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Fitness
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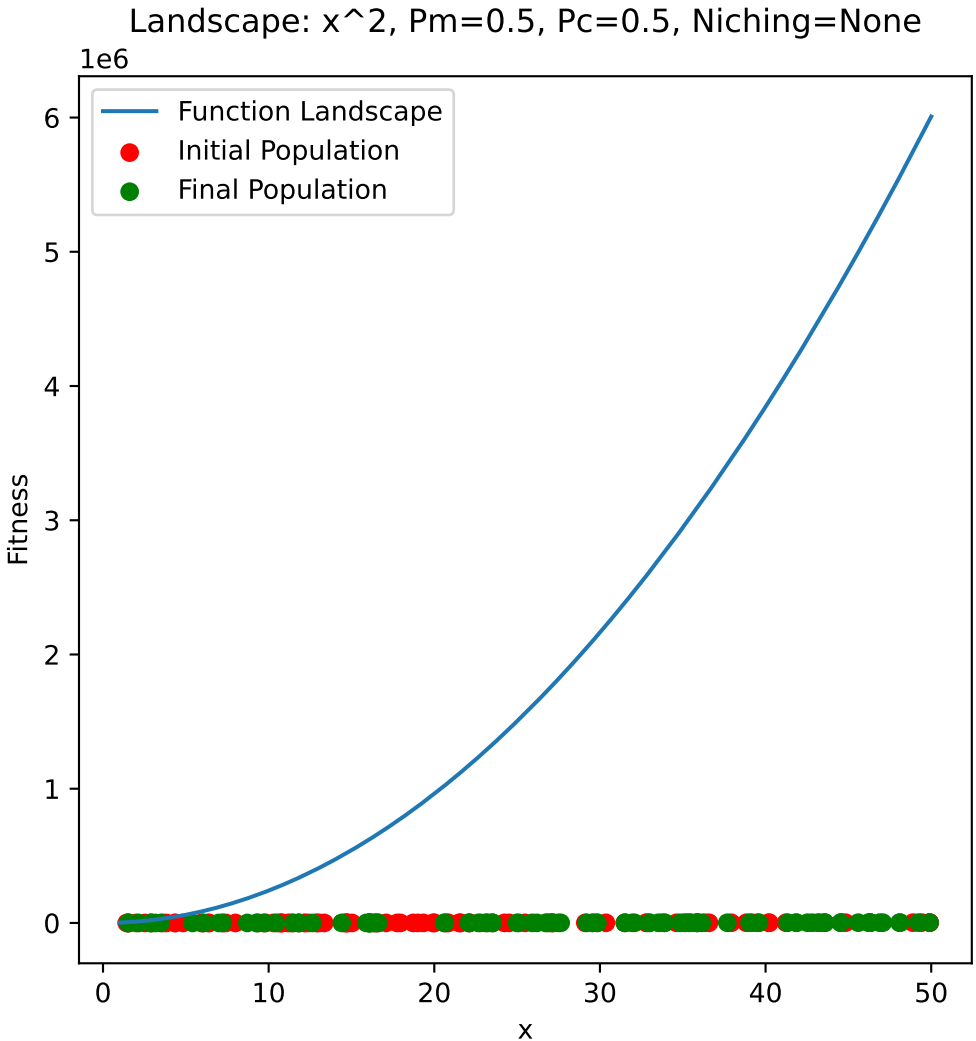
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.5, Pc=0.5, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
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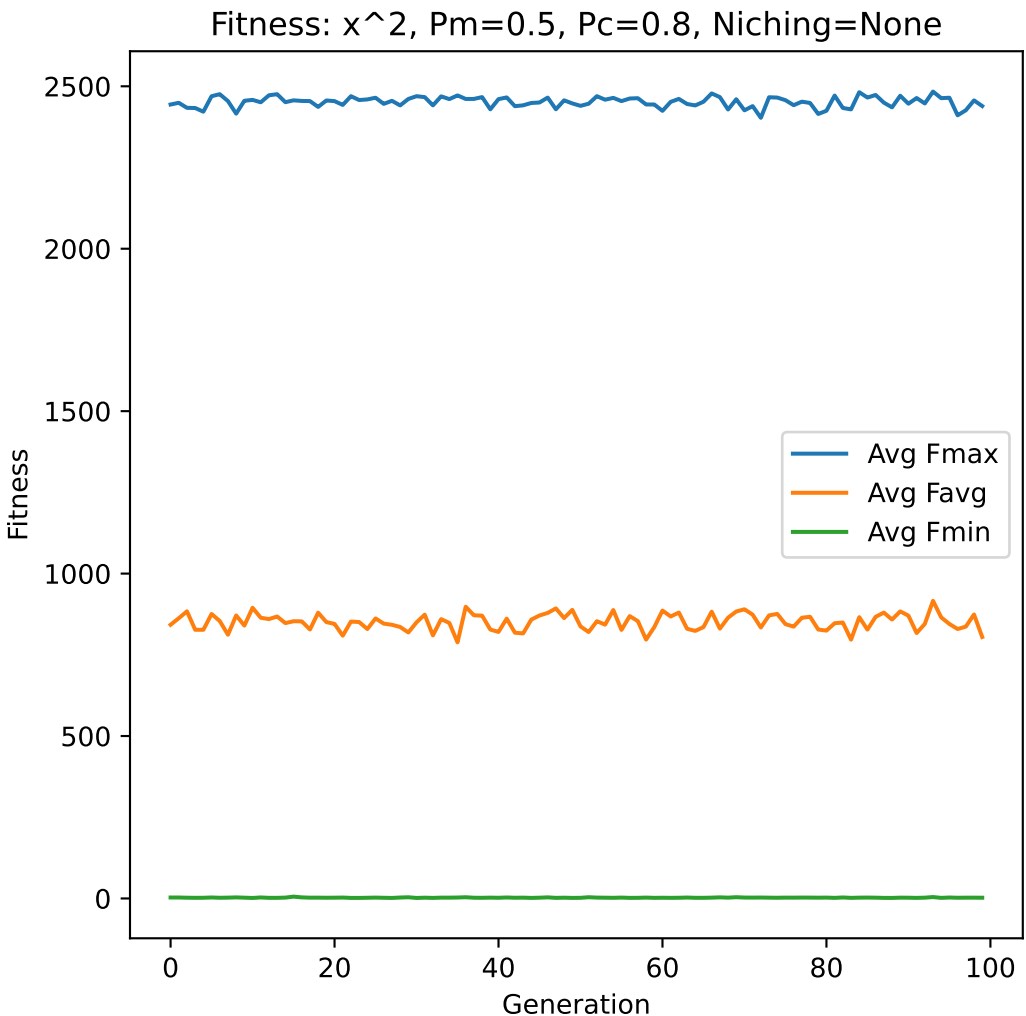
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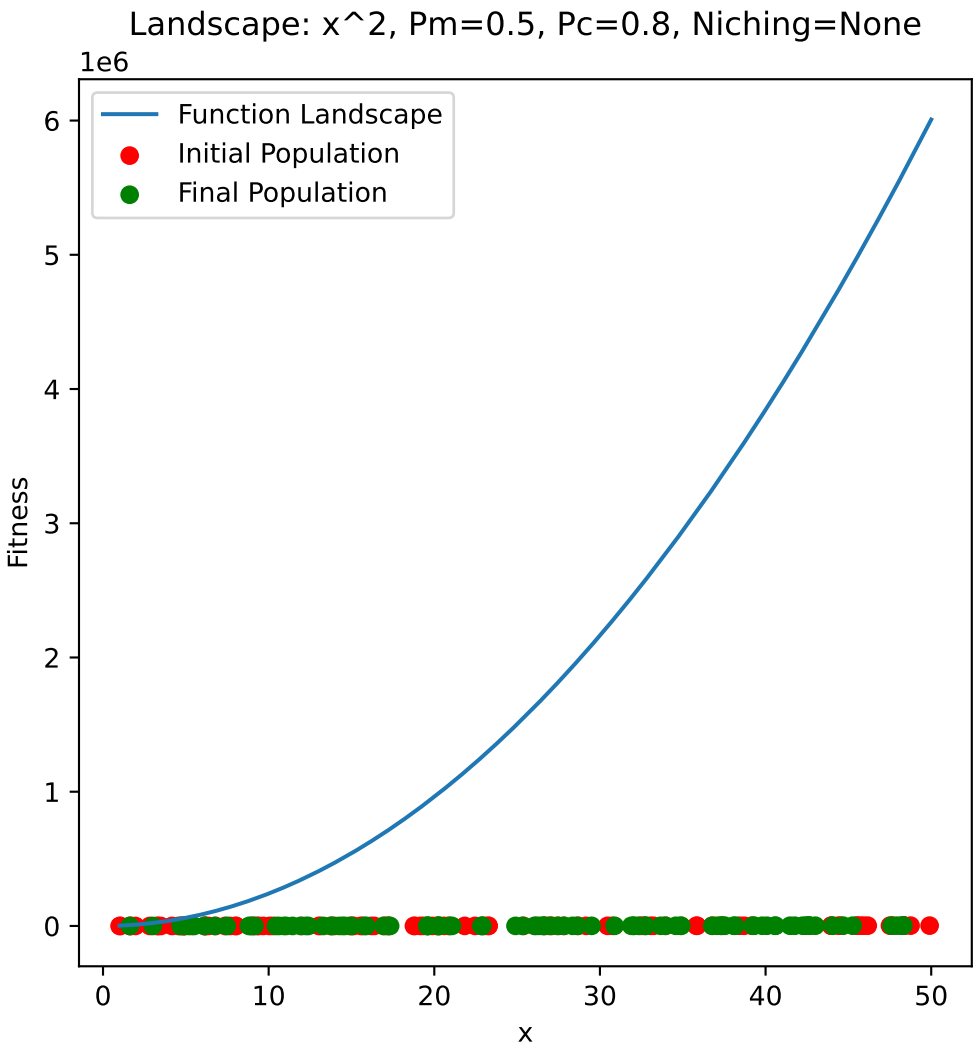
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.5, Pc=0.8, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
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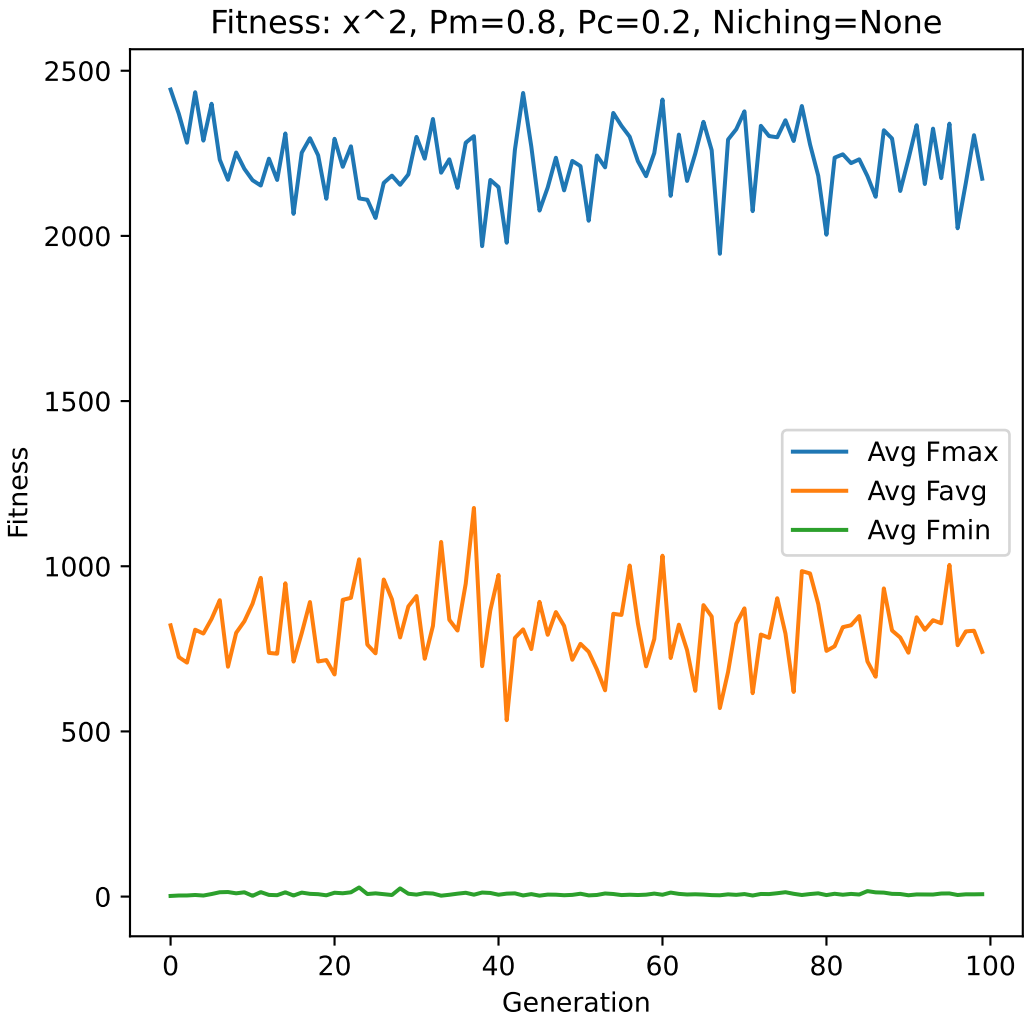
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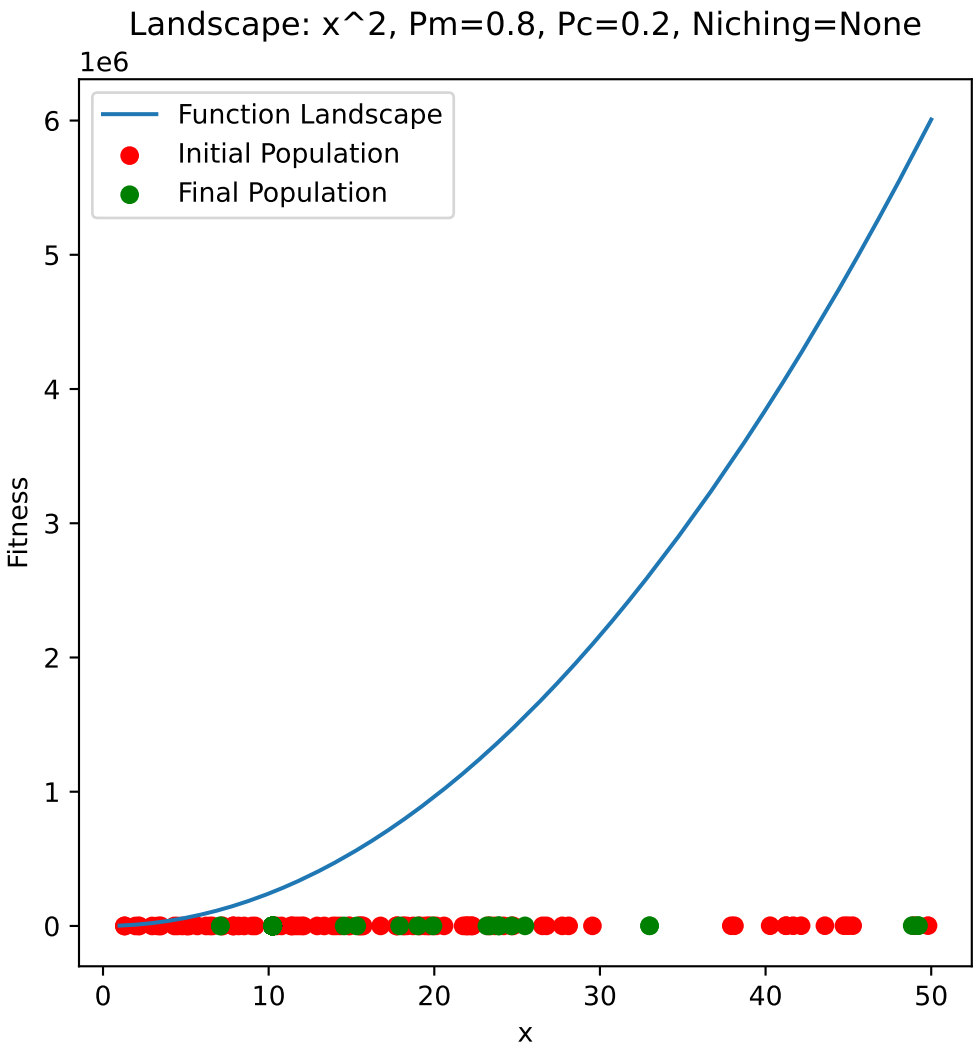
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.8, Pc=0.2, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
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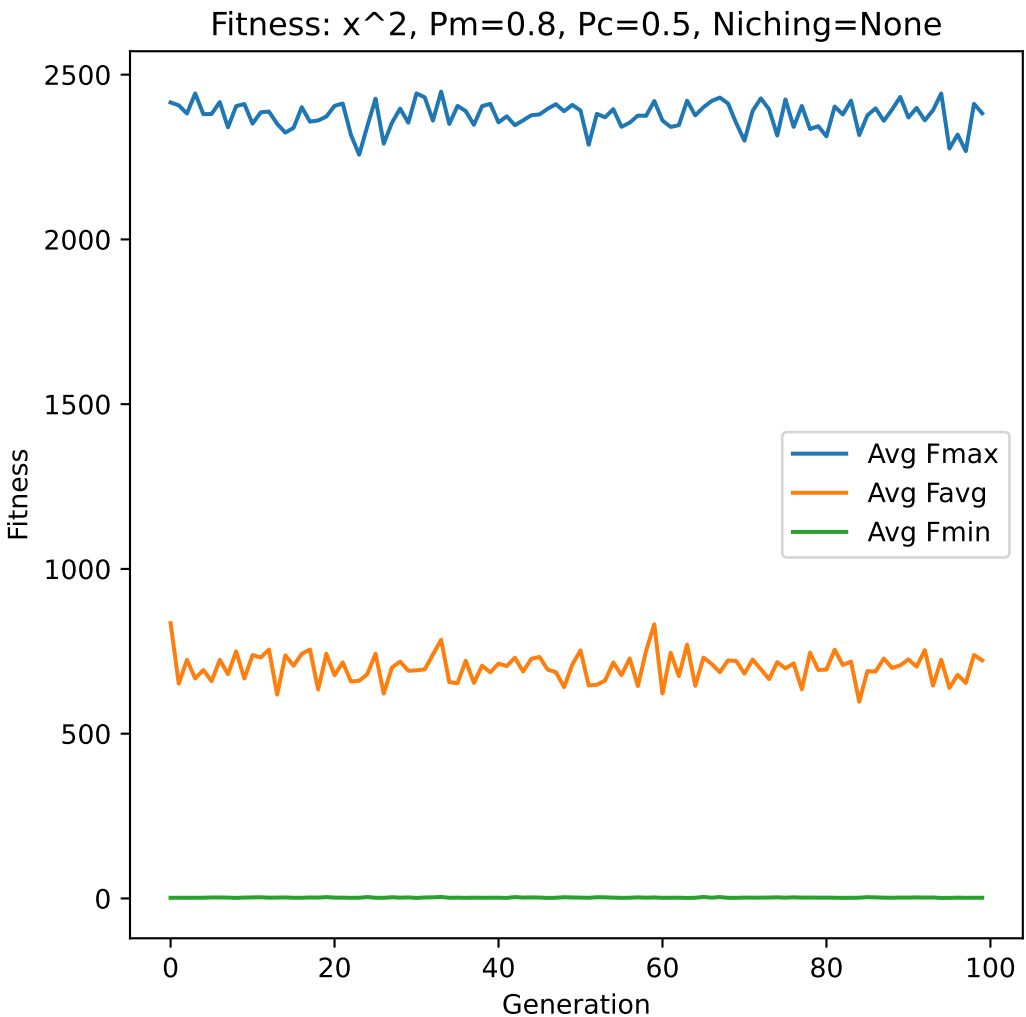
Fitness: x^2, Pm=0.8, Pc=0.5, Niching=None
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Fitness
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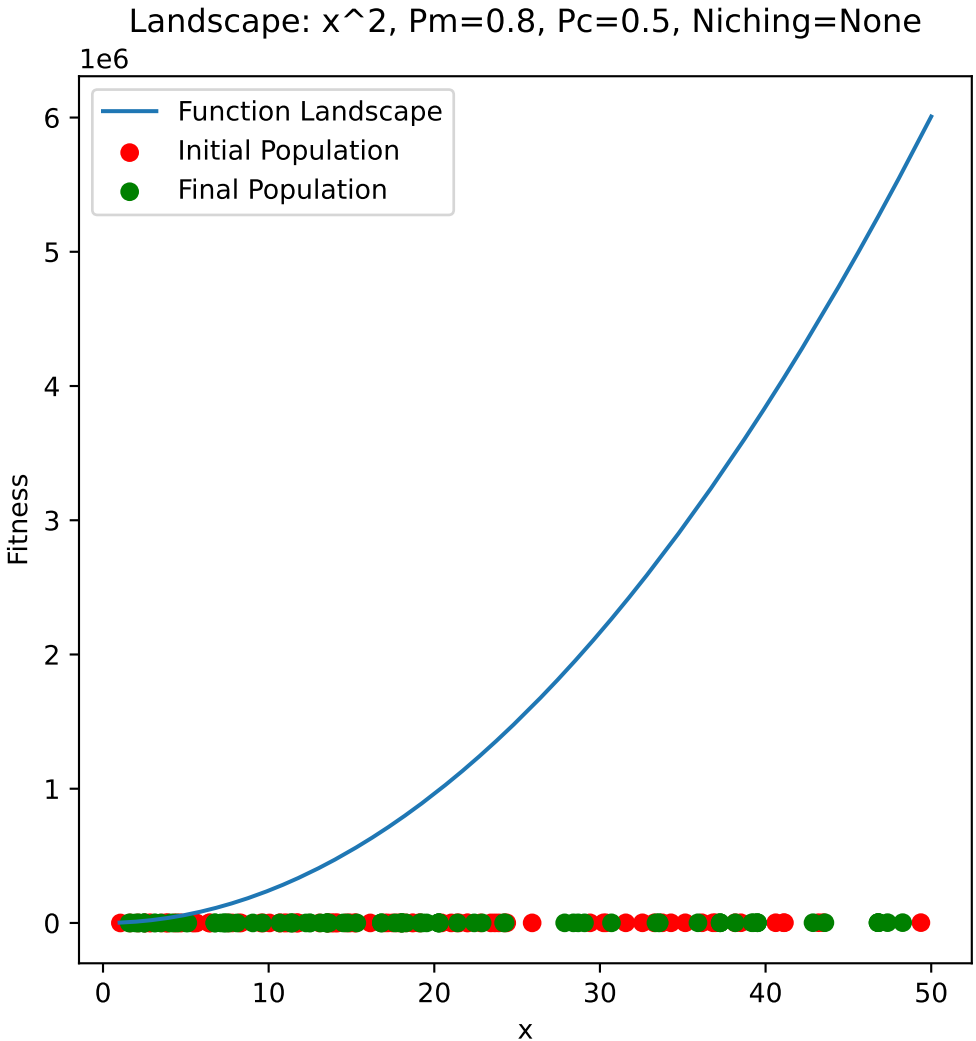
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.8, Pc=0.5, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
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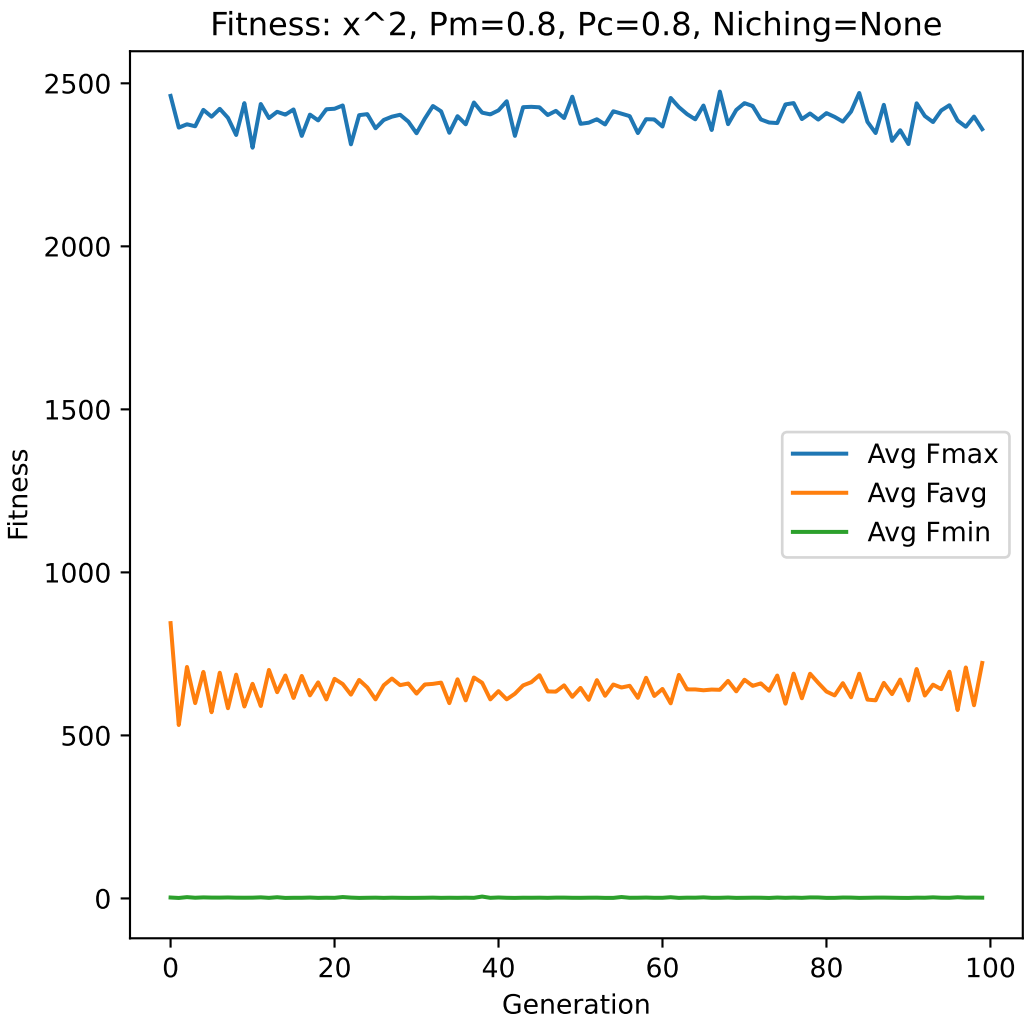
Fitness: x^2, Pm=0.8, Pc=0.8, Niching=None
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Fitness
0
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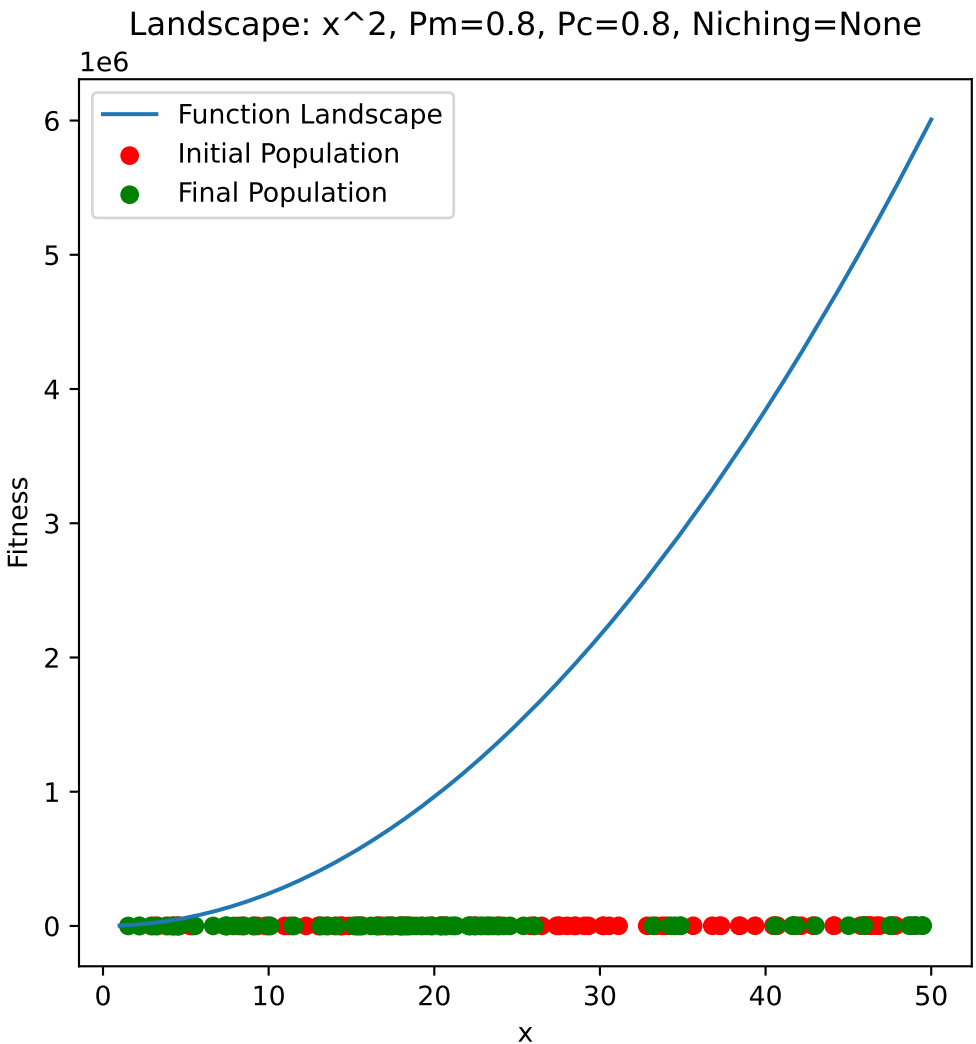
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.8, Pc=0.8, Niching=None
1e6
Function Landscape
Initial Population
Final Population
Fitness
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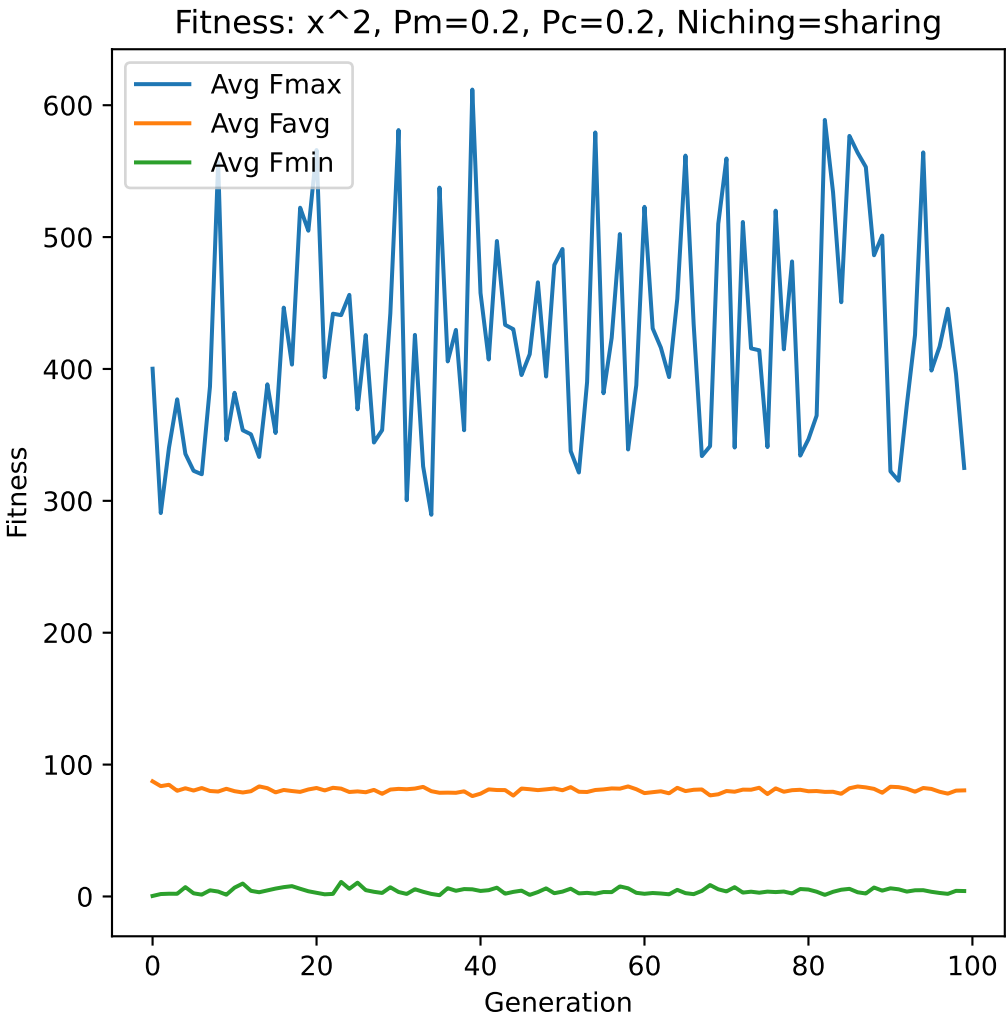
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Avg Favg
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Fitness
Generation
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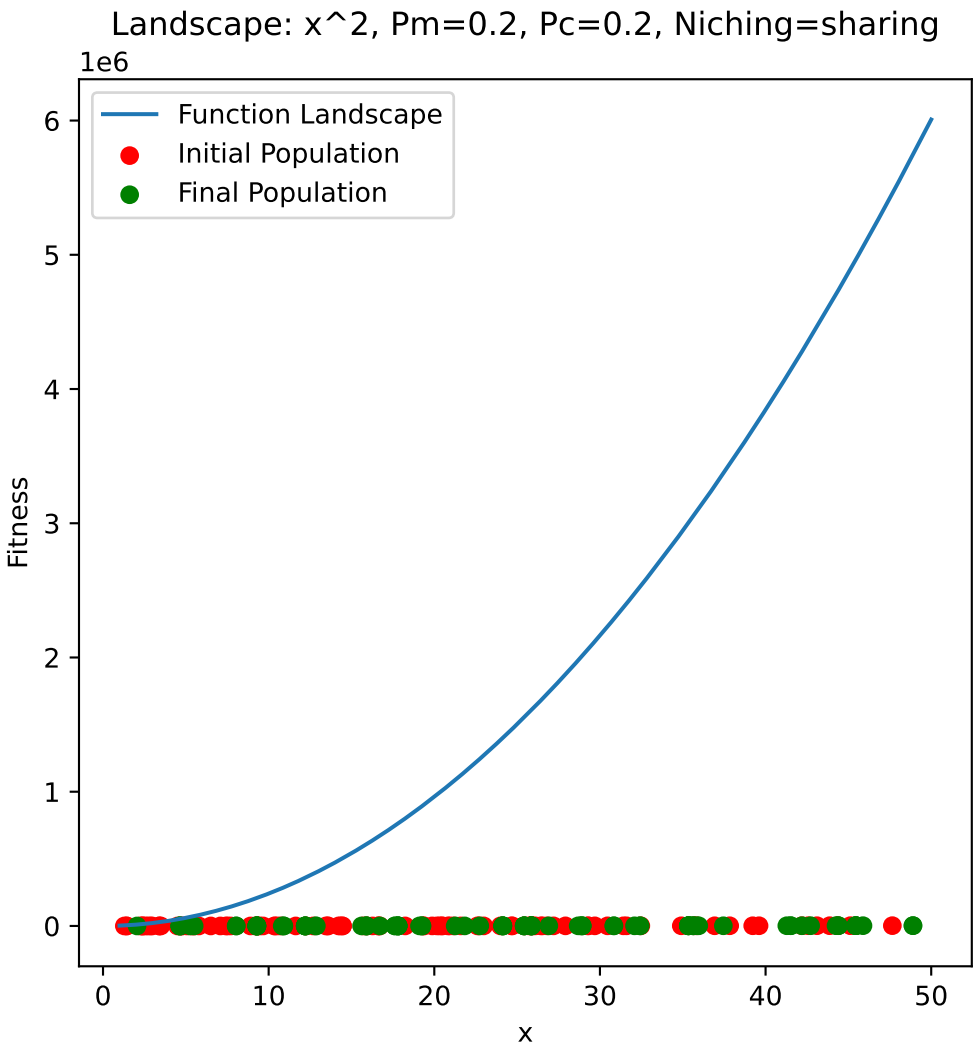
Landscape: x^2, Pm=0.2, Pc=0.2, Niching=sharing
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
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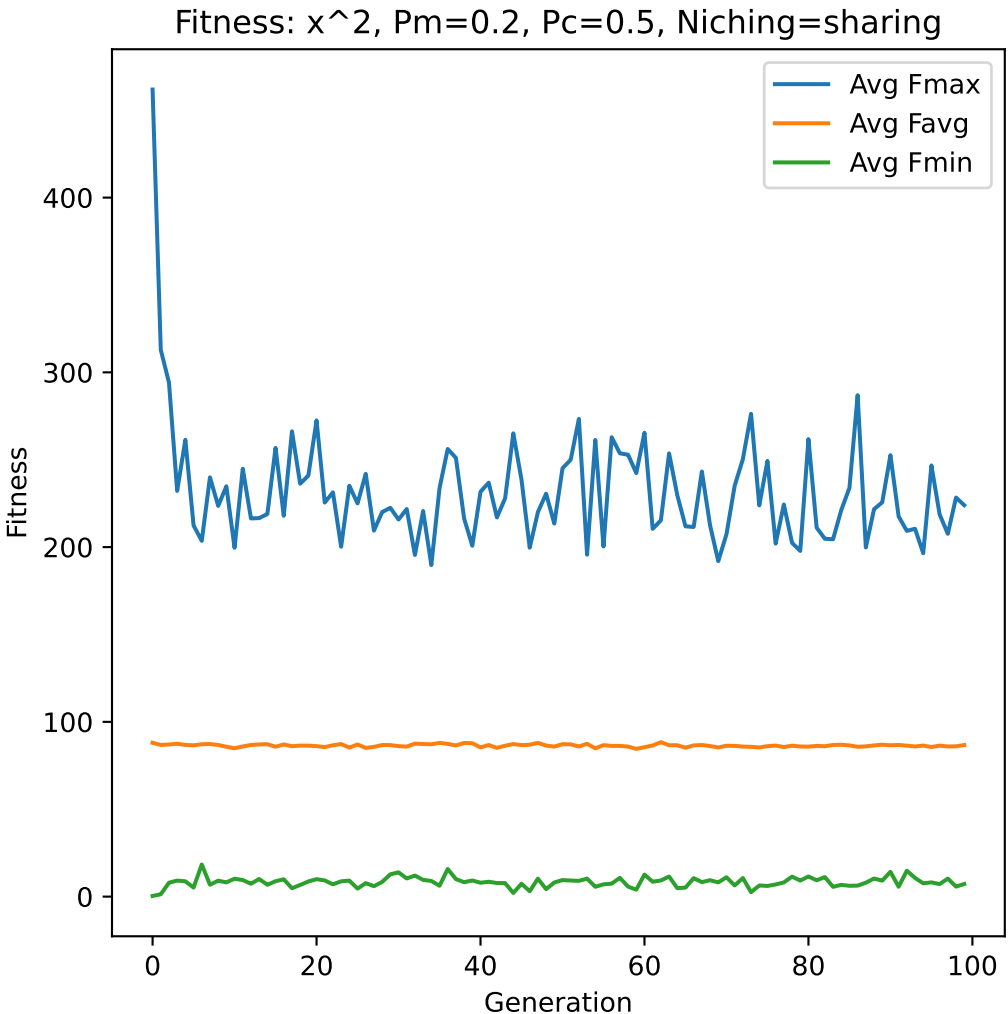
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Fitness
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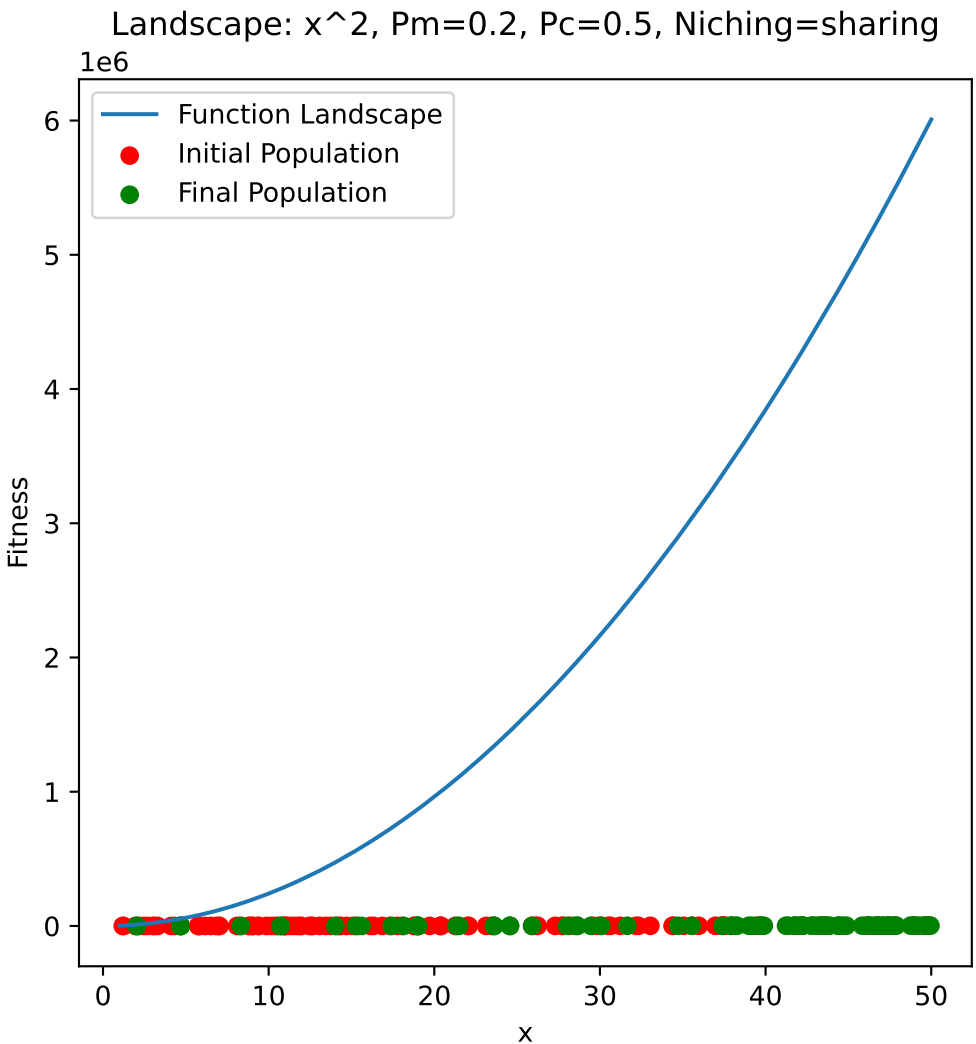
Generation


Landscape: x^2, Pm=0.2, Pc=0.5, Niching=sharing
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Function Landscape
Initial Population
Final Population
Fitness
x
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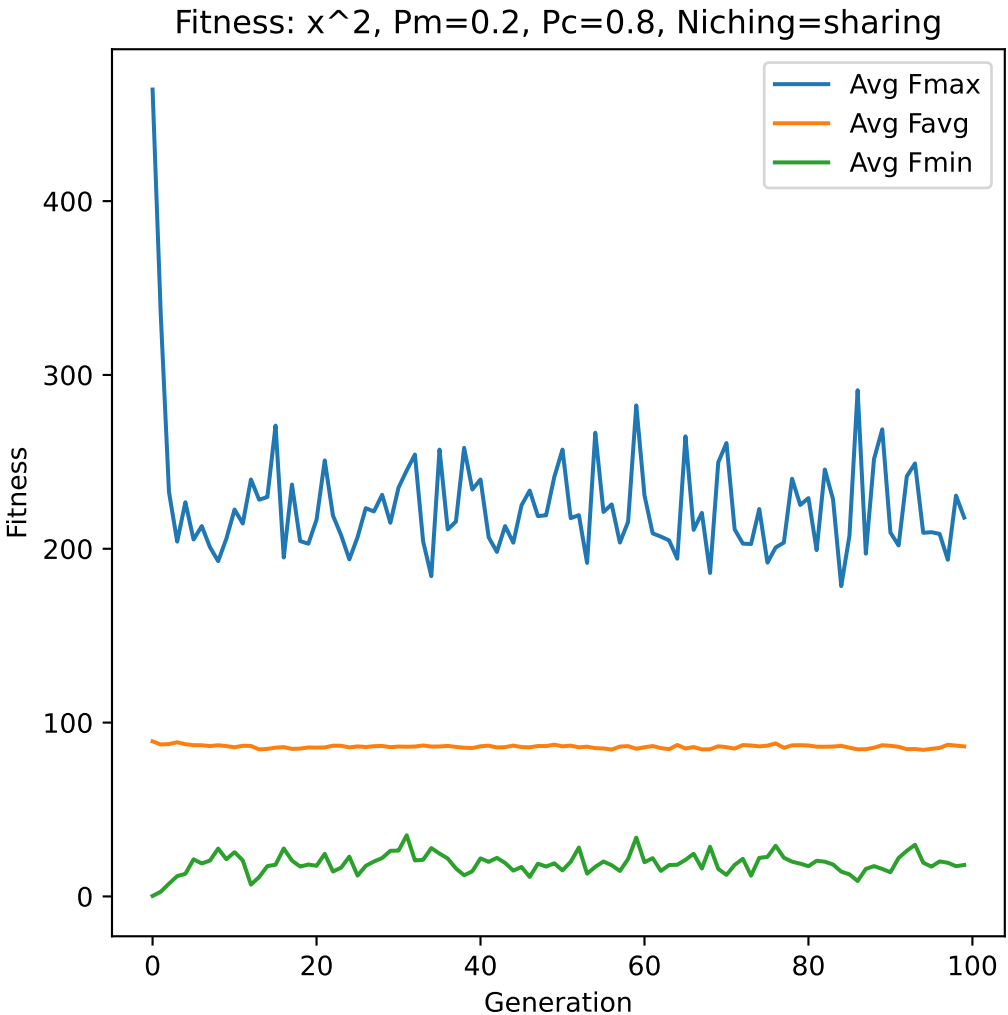
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Fitness
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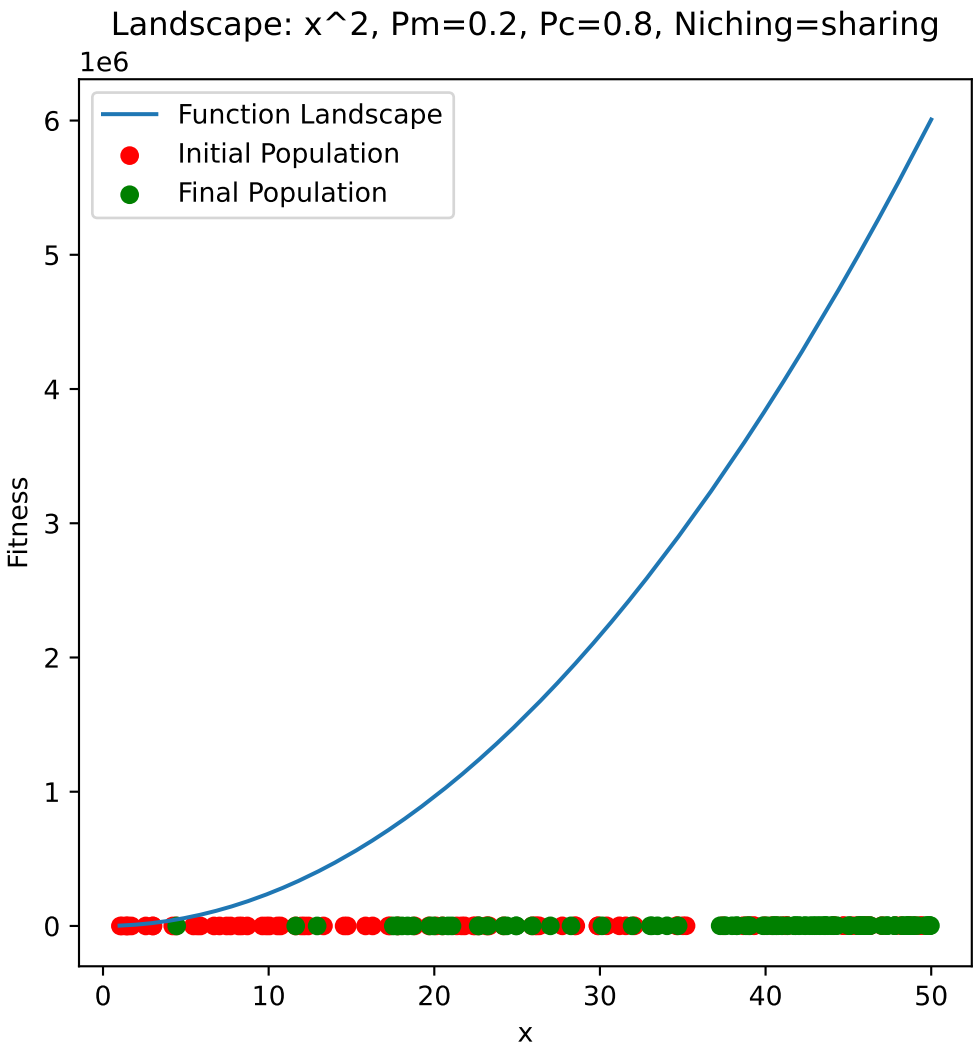
Generation


Landscape: x^2, Pm=0.2, Pc=0.8, Niching=sharing
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
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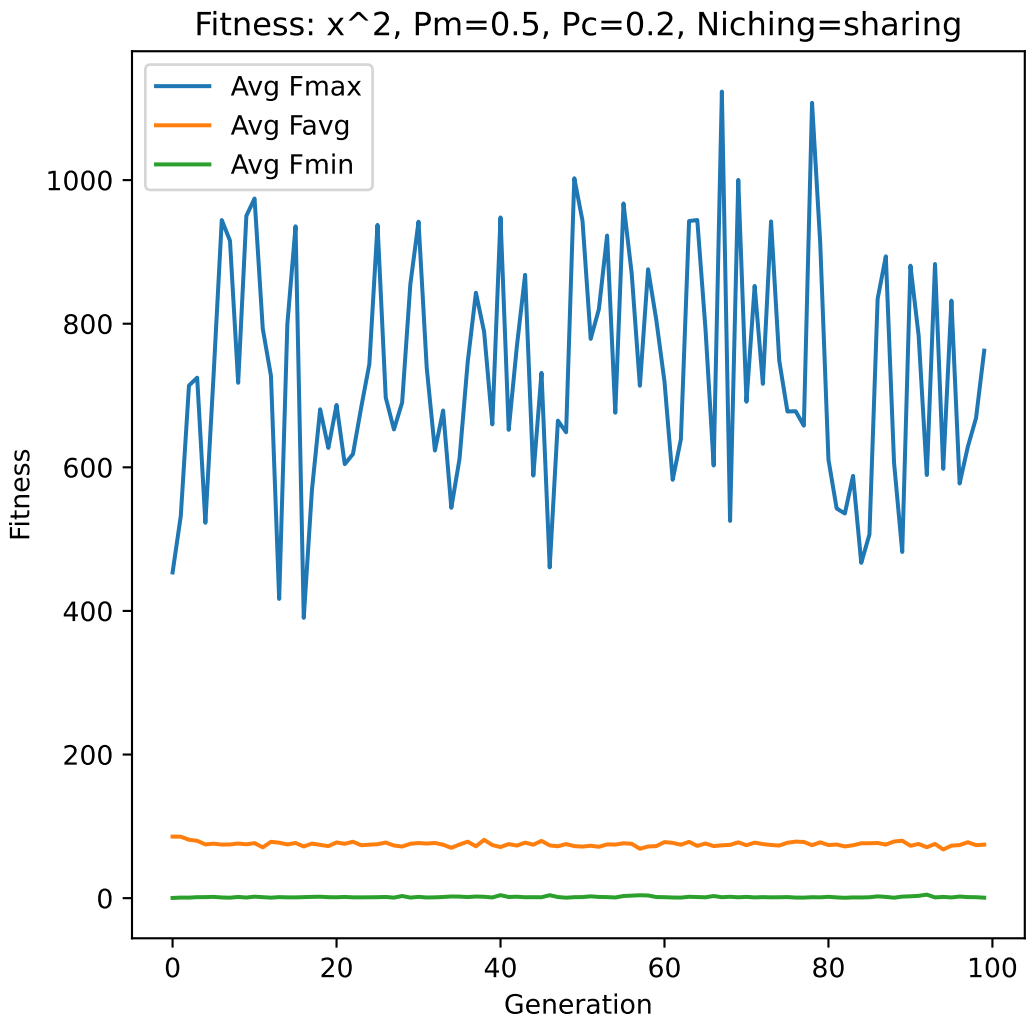
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Avg Fmin
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Fitness
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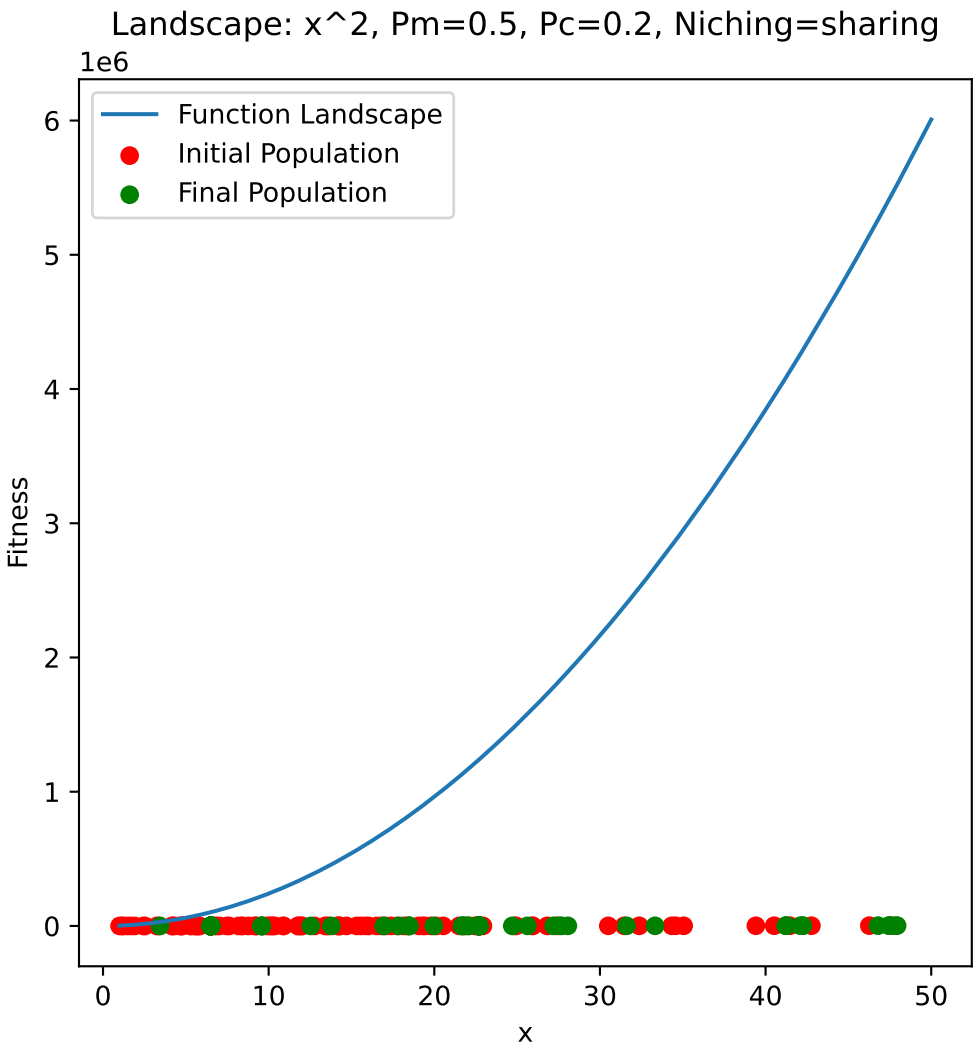
Generation


Landscape: x^2, Pm=0.5, Pc=0.2, Niching=sharing
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
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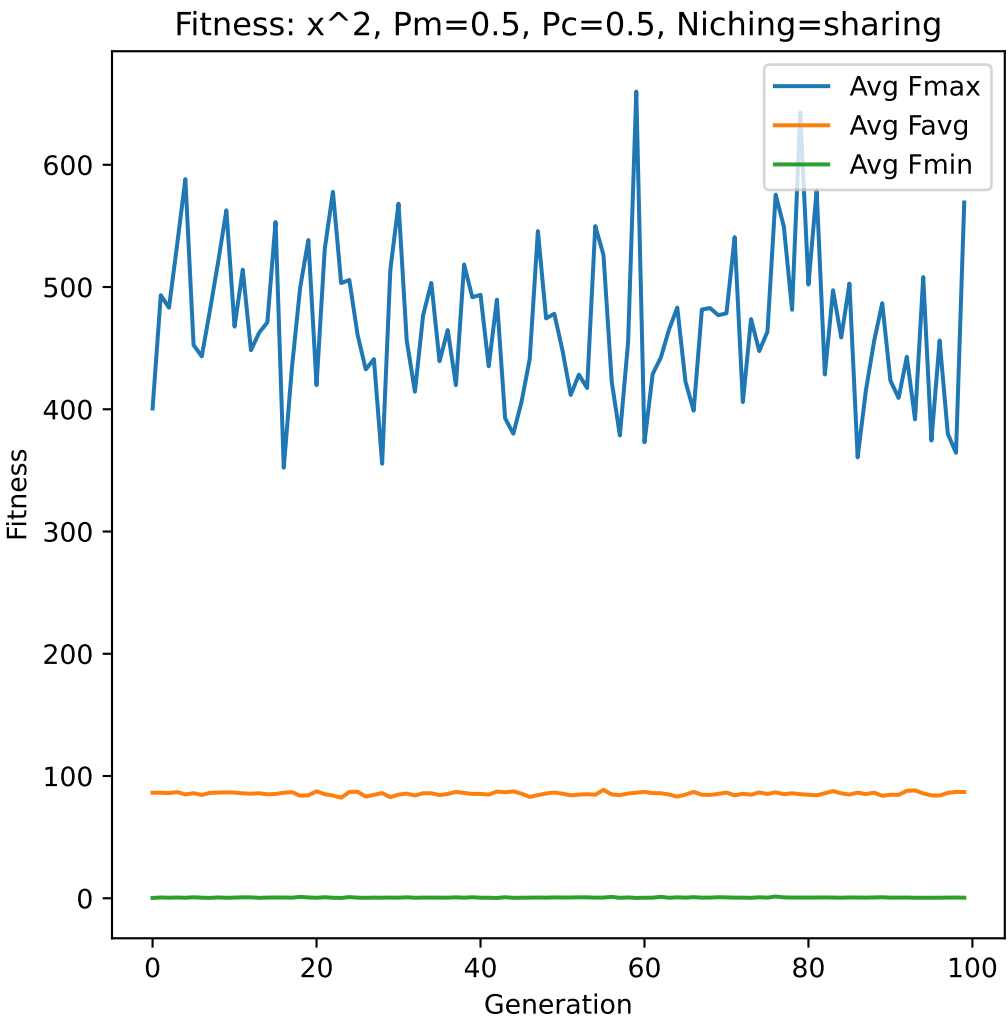
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Avg Fmax
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Fitness
Generation
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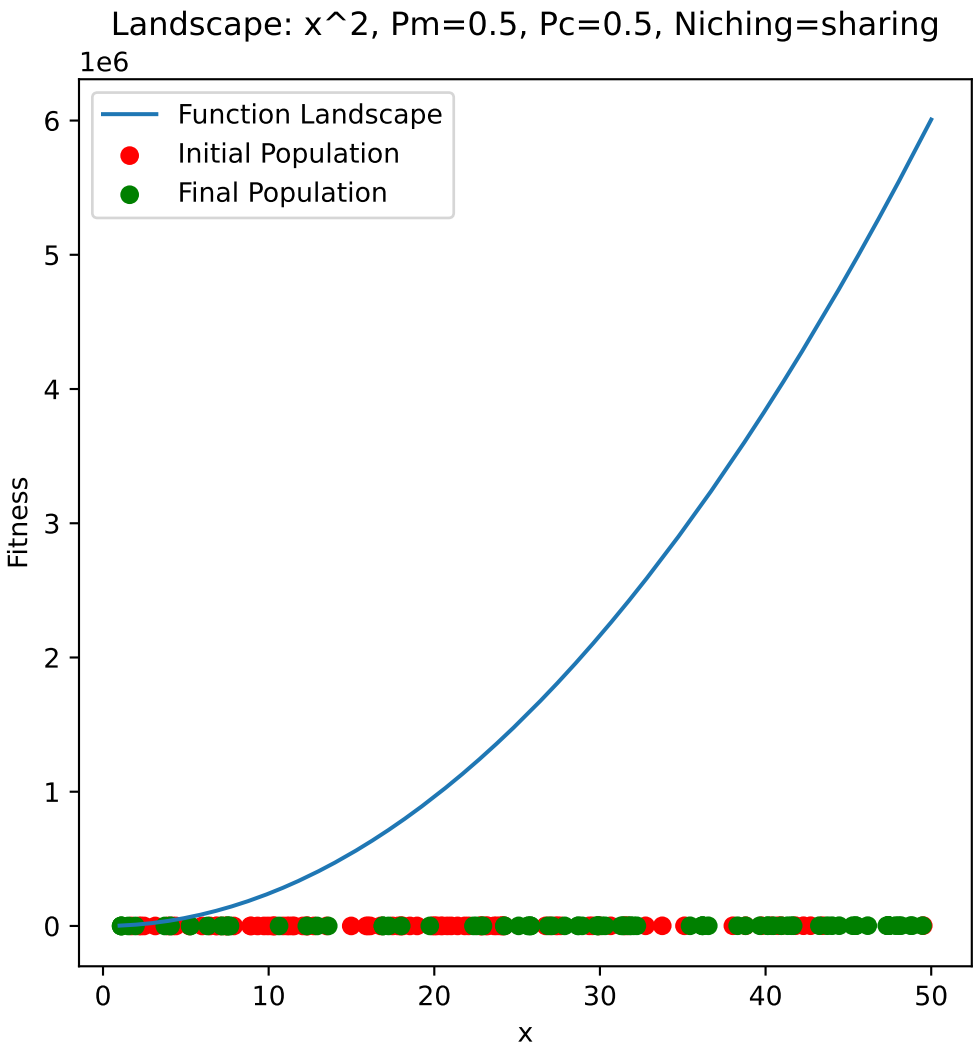
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1e6
Function Landscape
Initial Population
Final Population
Fitness
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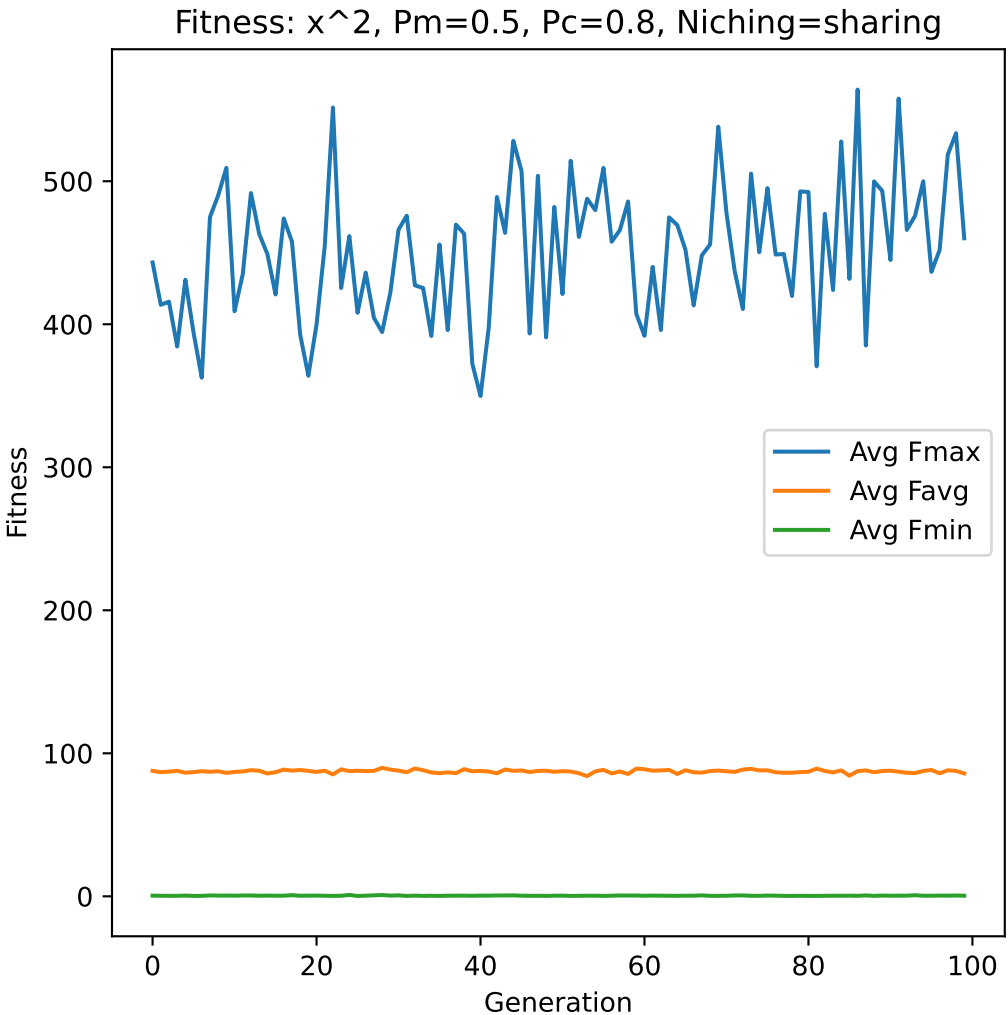
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Avg Favg
Avg Fmin
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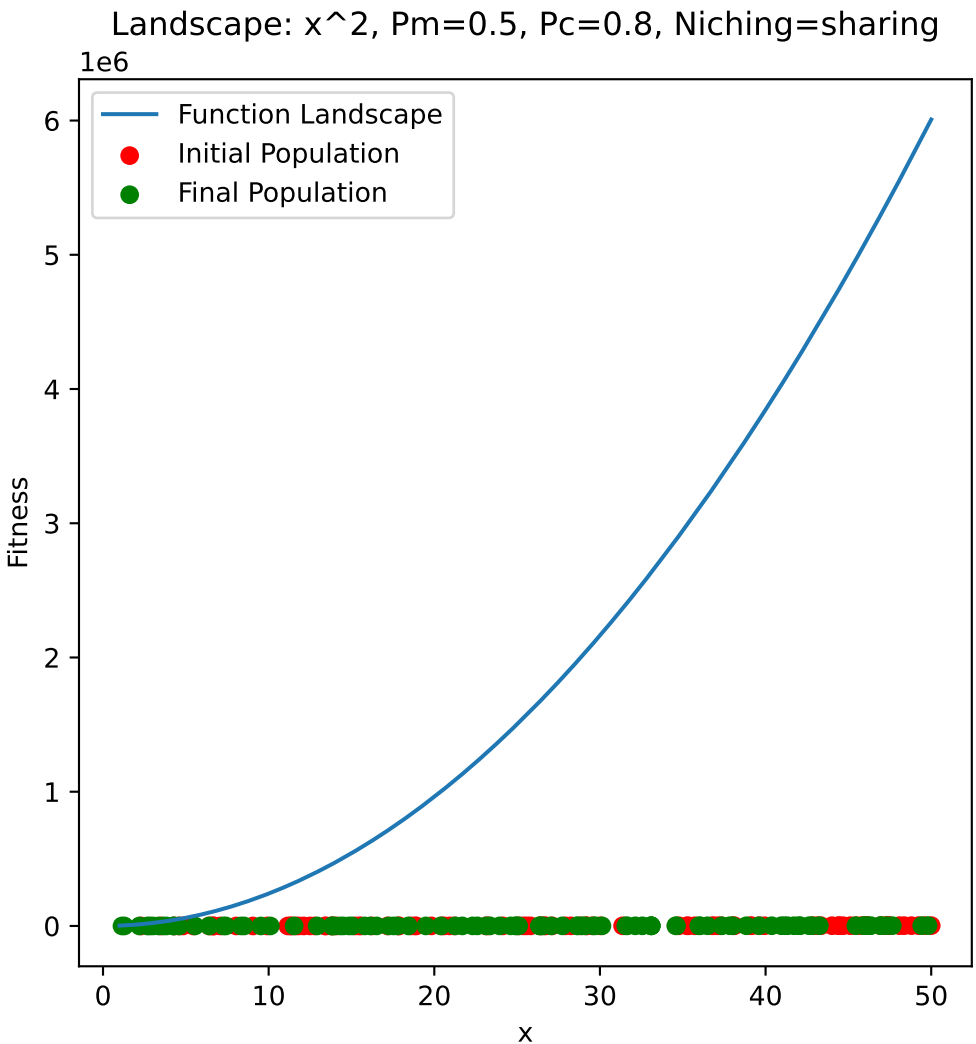
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Function Landscape
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Final Population
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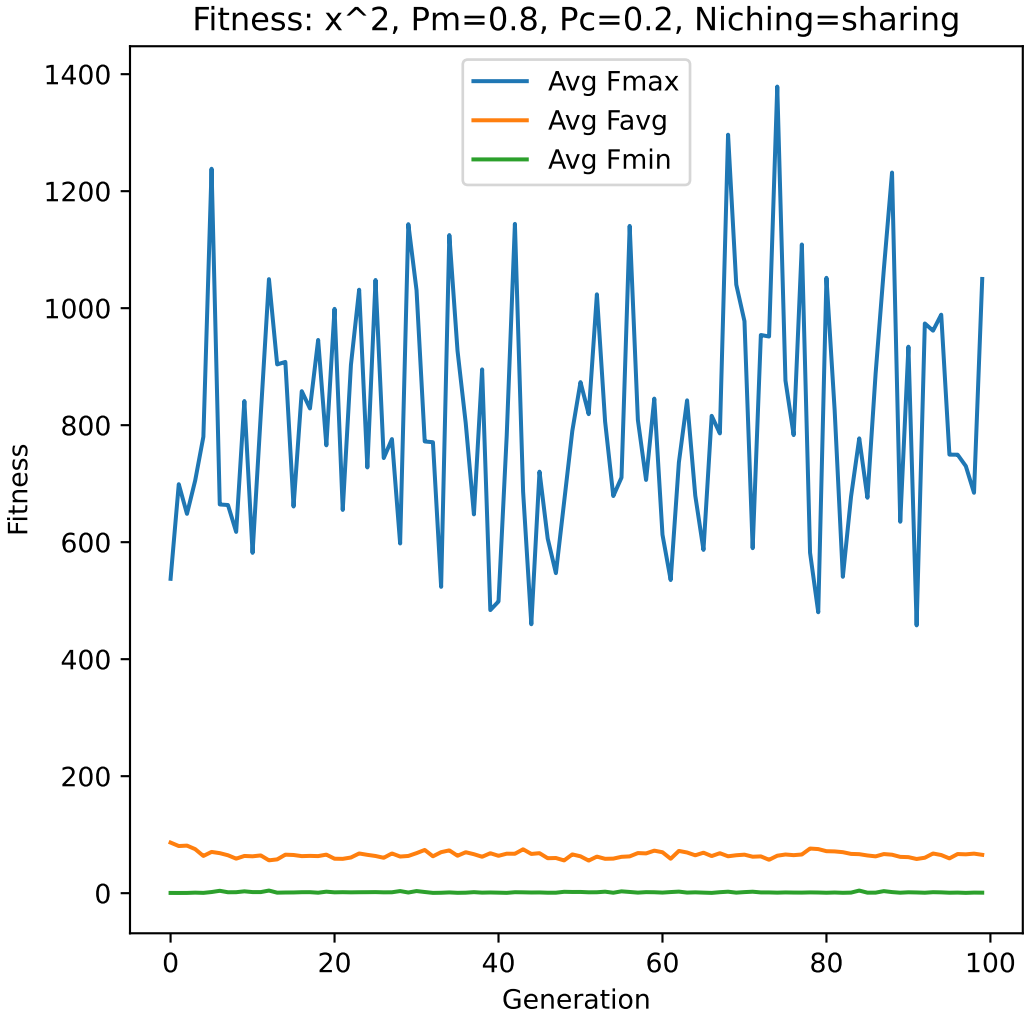
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Avg Fmax
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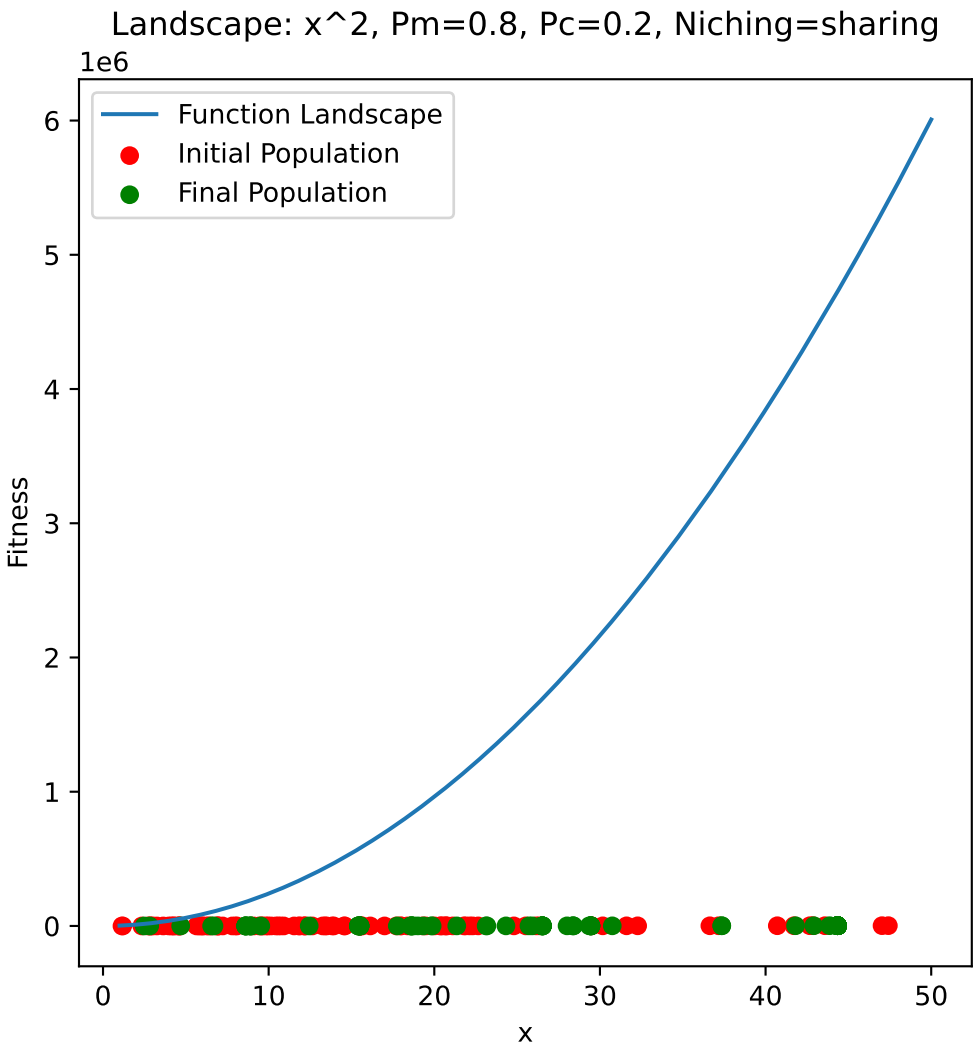
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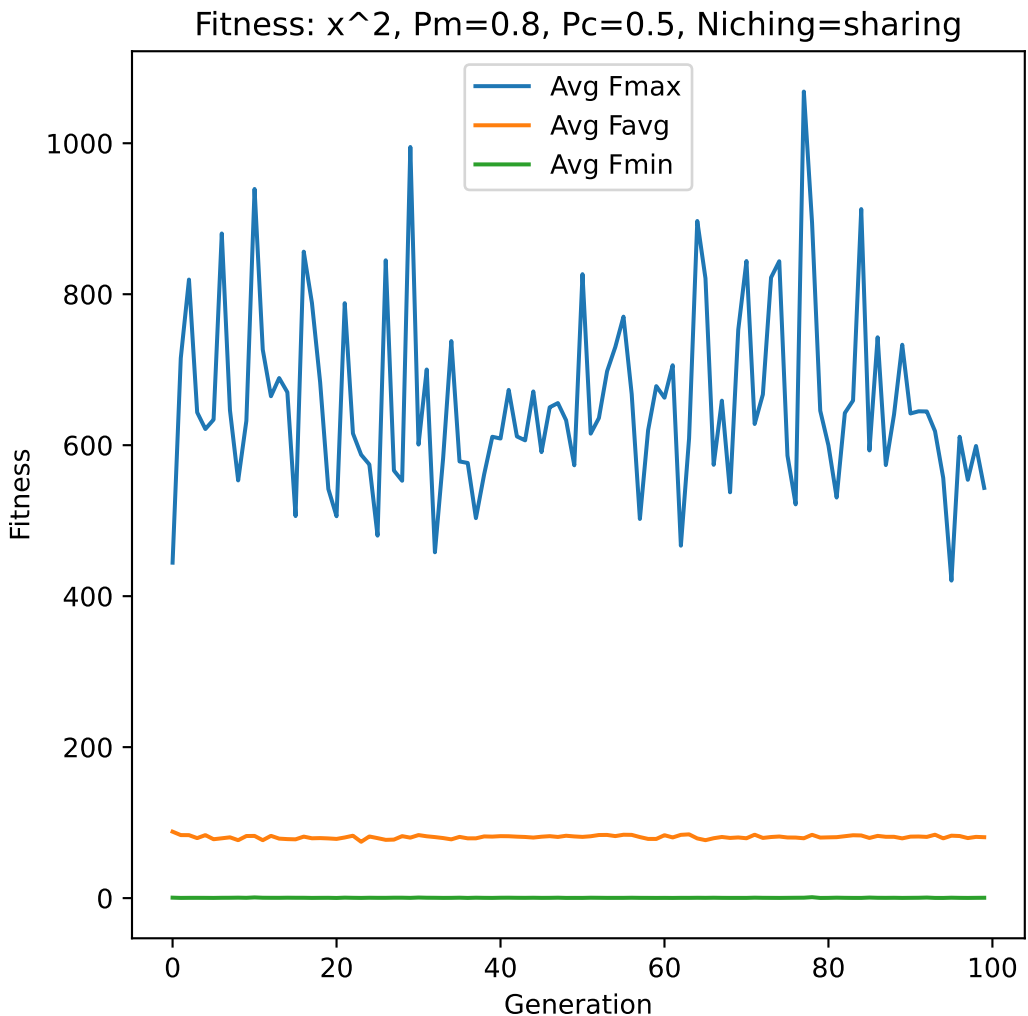
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Avg Fmin
Fitness
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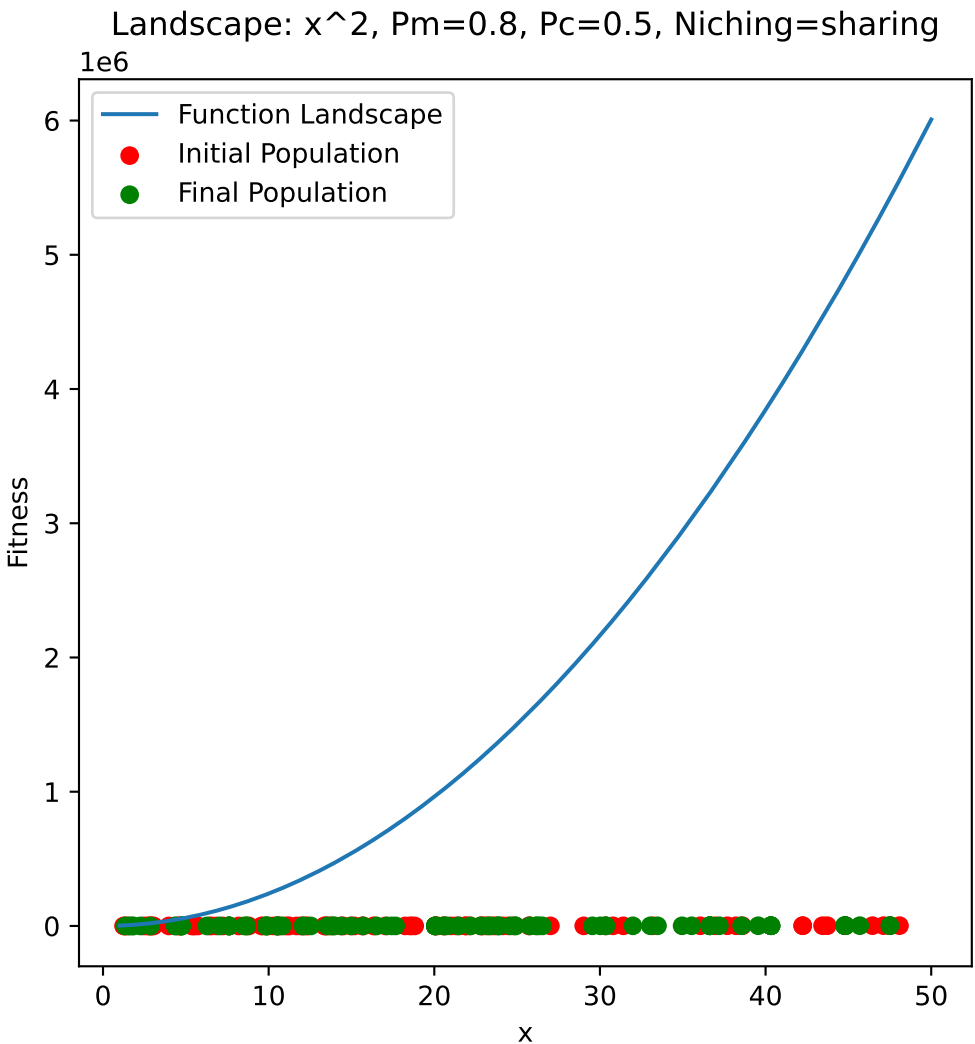
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Final Population
Fitness
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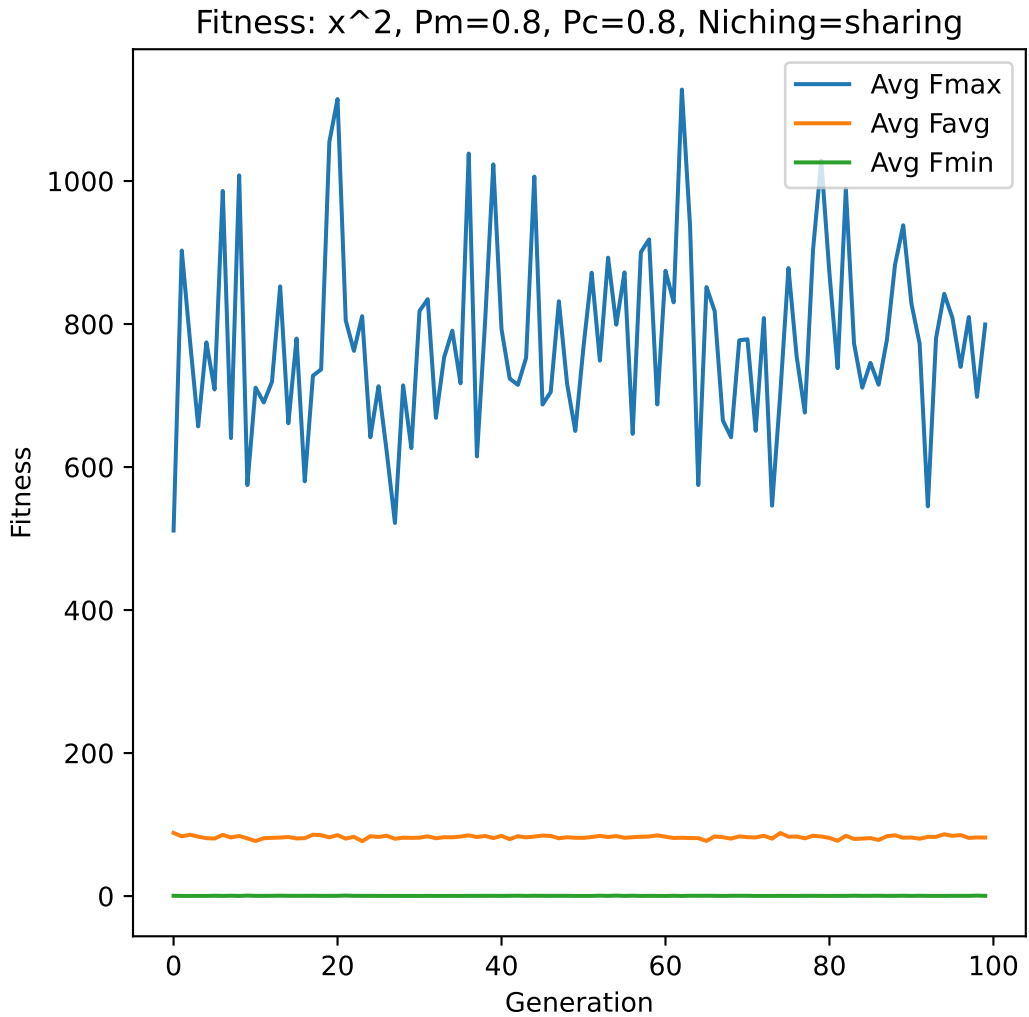
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Avg Fmax
Avg Favg
Avg Fmin
Fitness
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80
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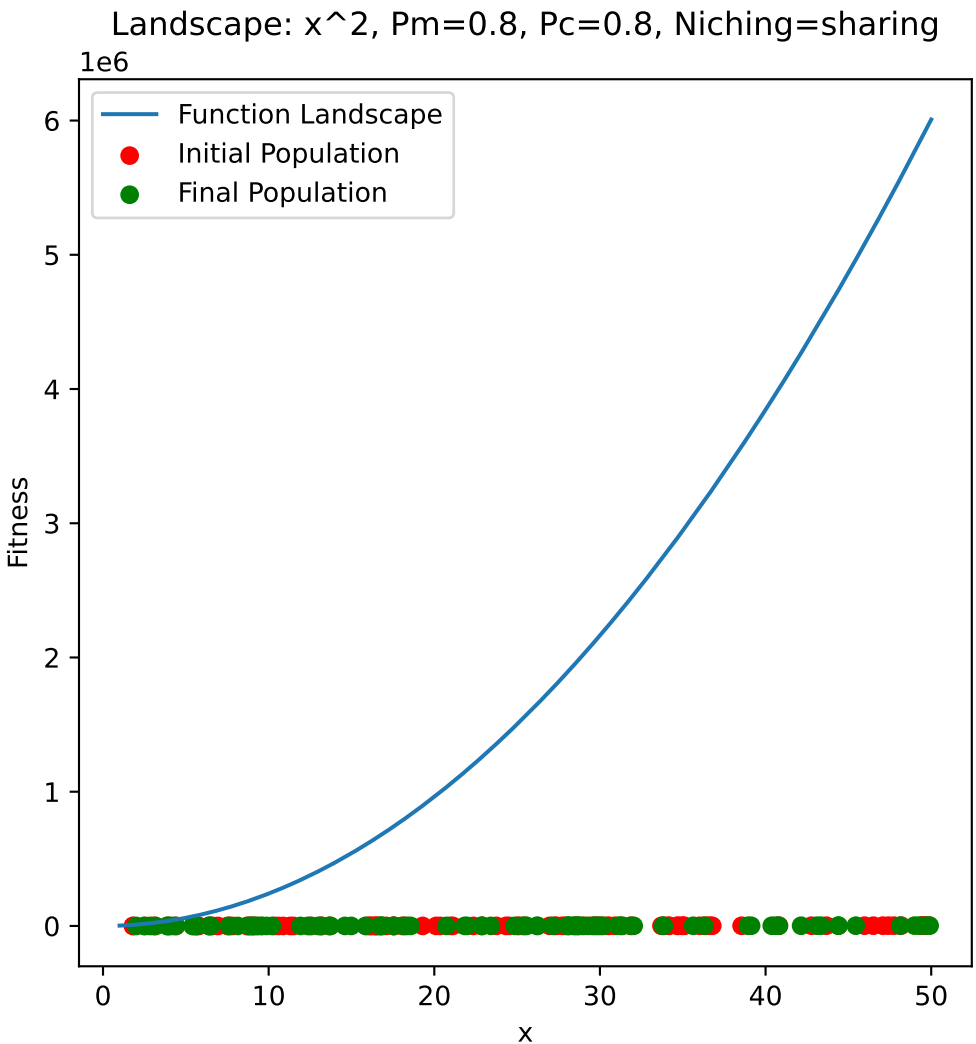
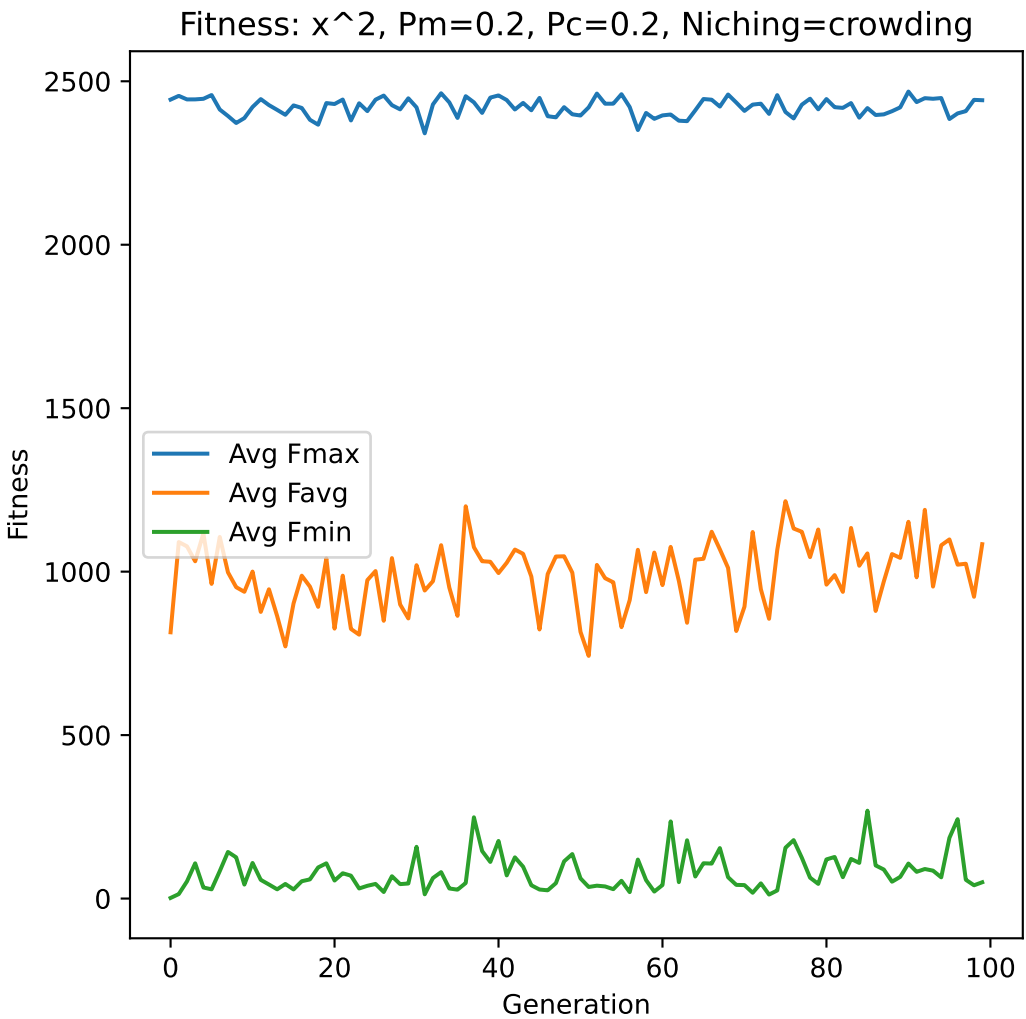
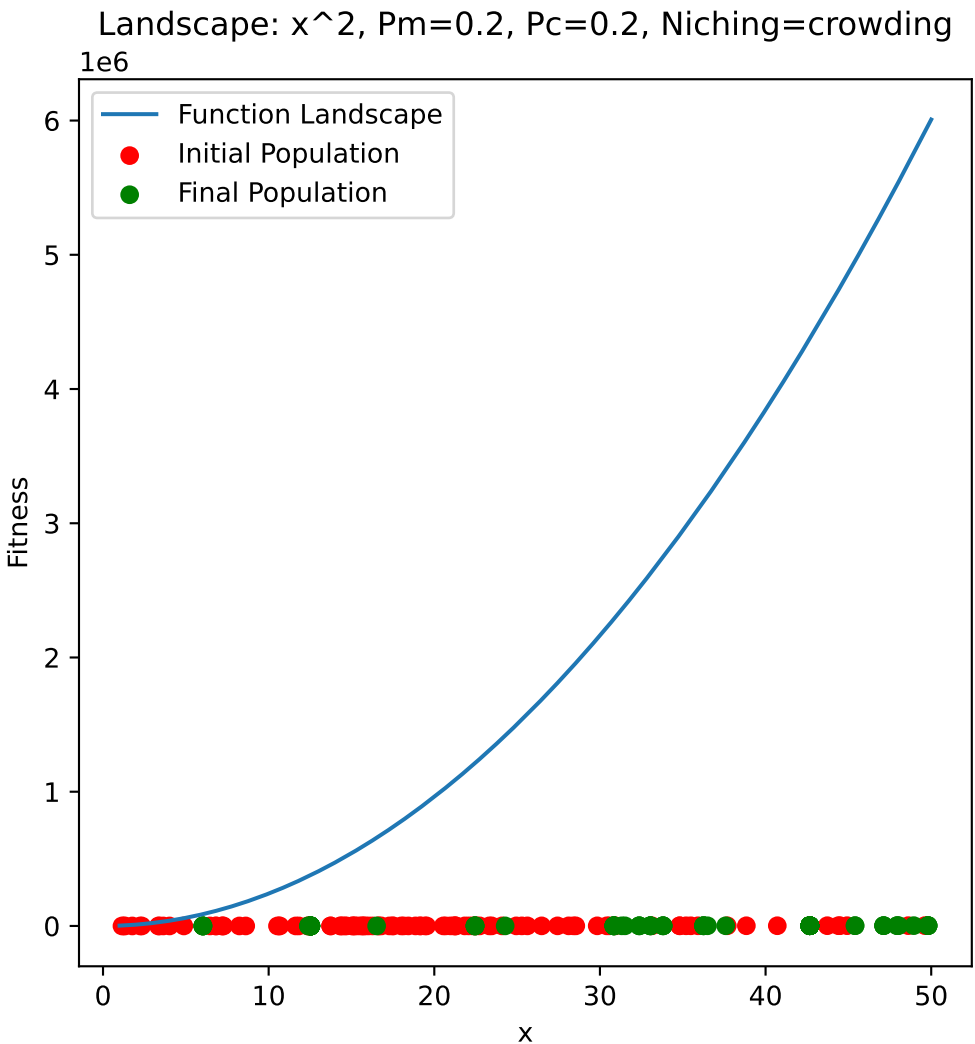
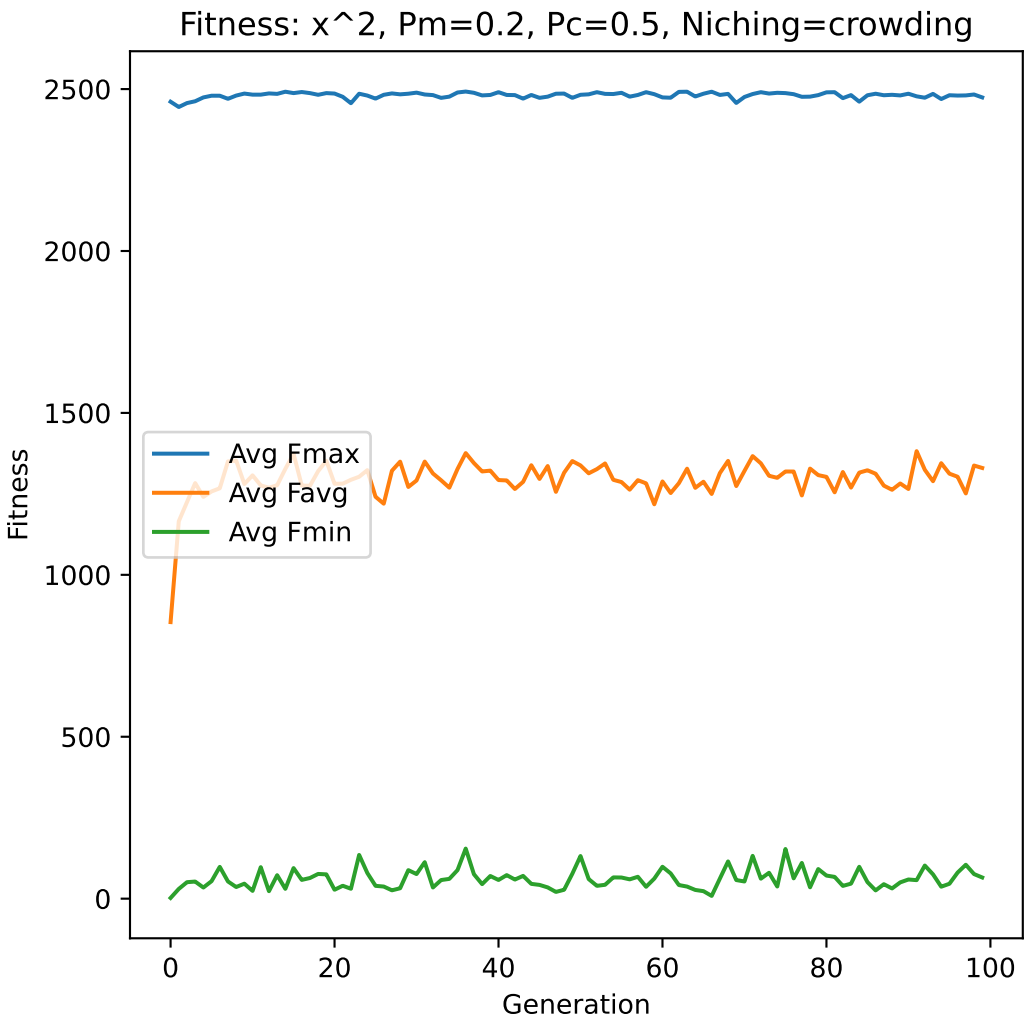

Landscape: x^2, Pm=0.8, Pc=0.8, Niching=sharing
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
10
20
30
40
50


Fitness: x^2, Pm=0.2, Pc=0.2, Niching=crowding
Avg Fmax
Avg Favg
Avg Fmin
Fitness
Generation
2500
2000
1500
1000
500
0
0
20
40
60
80
100


Landscape: x^2, Pm=0.2, Pc=0.2, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
10
20
30
40
50


Fitness: x^2, Pm=0.2, Pc=0.5, Niching=crowding
Avg Fmax
Avg Favg
Avg Fmin
Fitness
Generation
2500
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1000
500
0
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80
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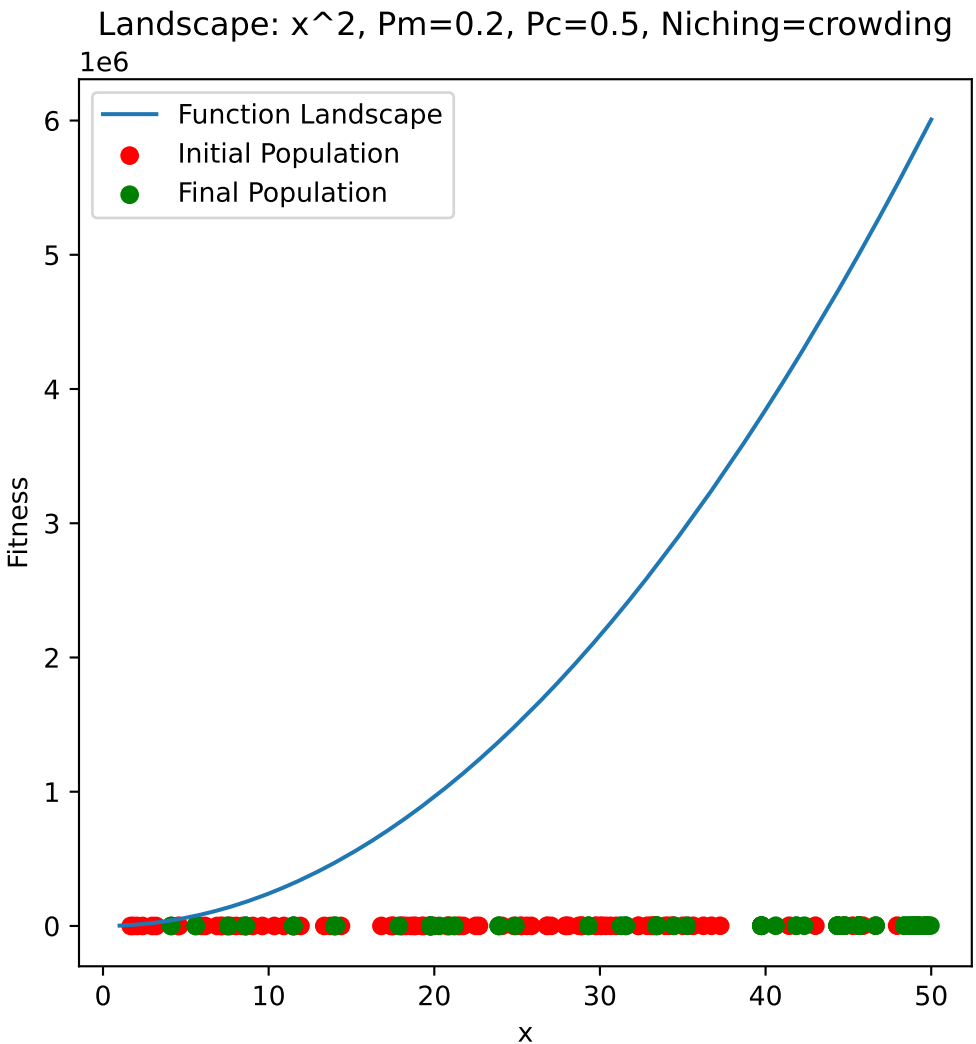
Landscape: x^2, Pm=0.2, Pc=0.5, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
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20
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40
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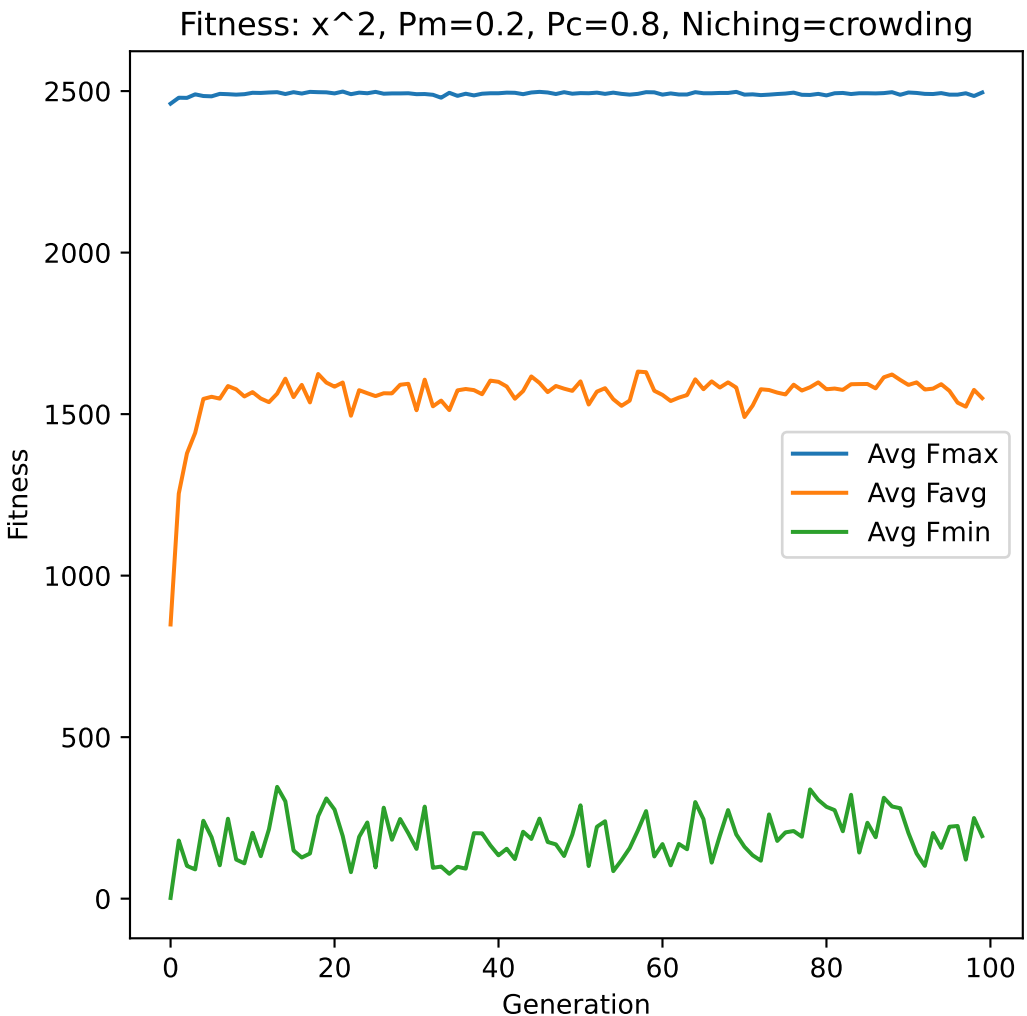
Fitness: x^2, Pm=0.2, Pc=0.8, Niching=crowding
2500
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1500
1000
500
0
Fitness
0
20
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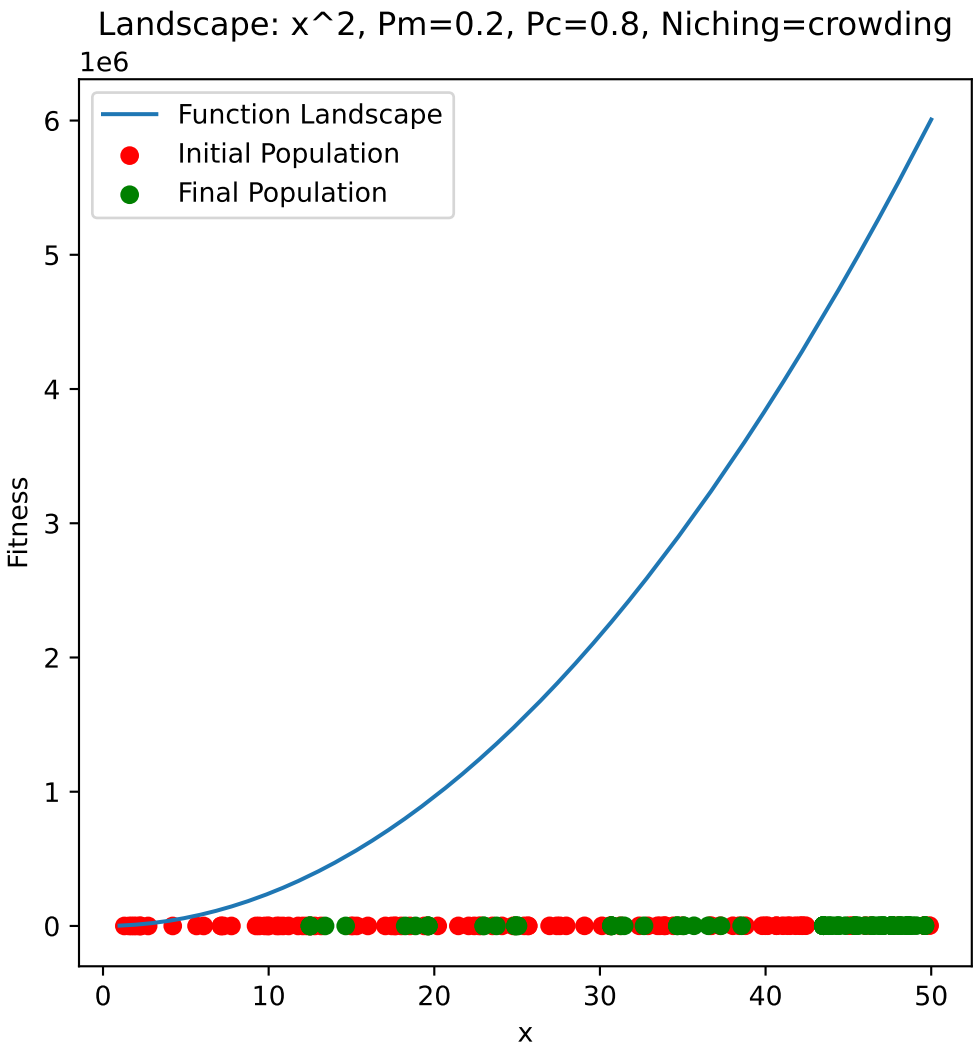
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.2, Pc=0.8, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
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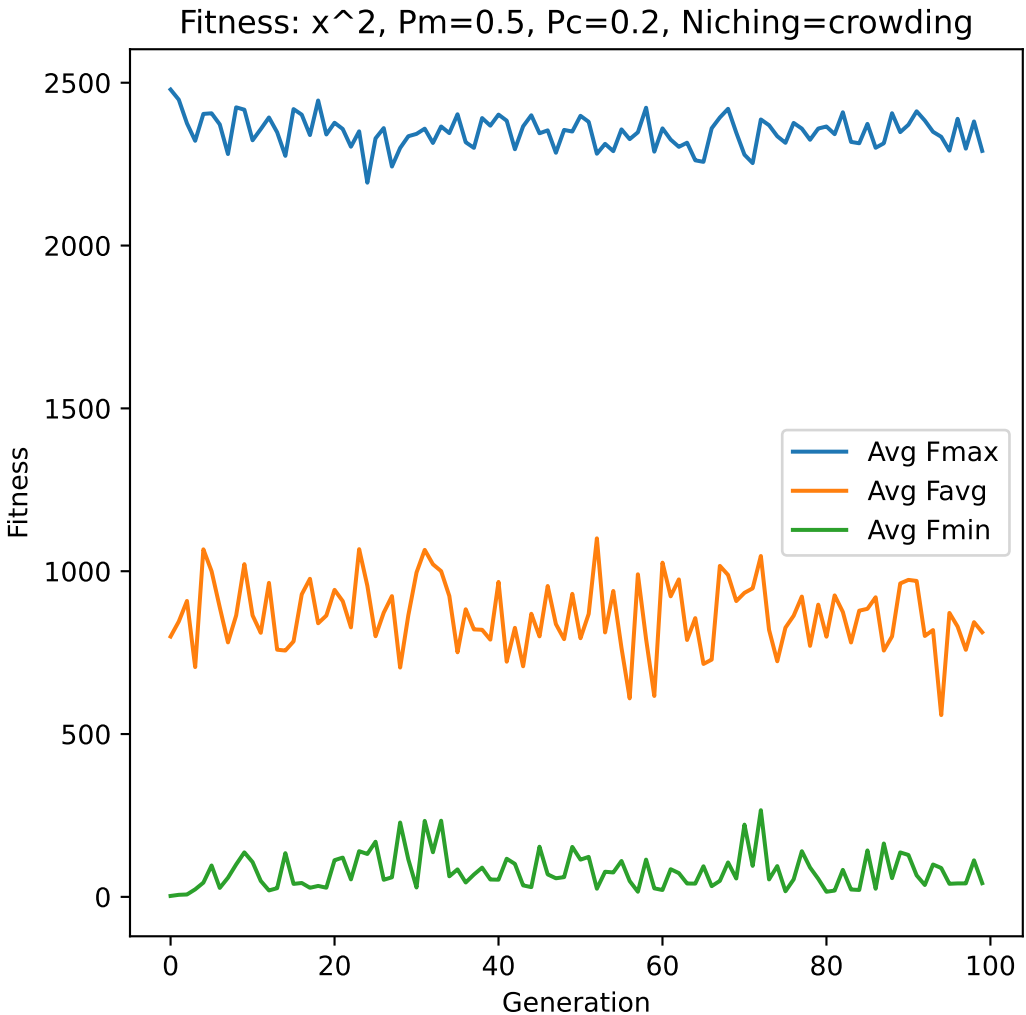
20
30
40
50


Fitness: x^2, Pm=0.5, Pc=0.2, Niching=crowding
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2000
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1000
500
0
Fitness
0
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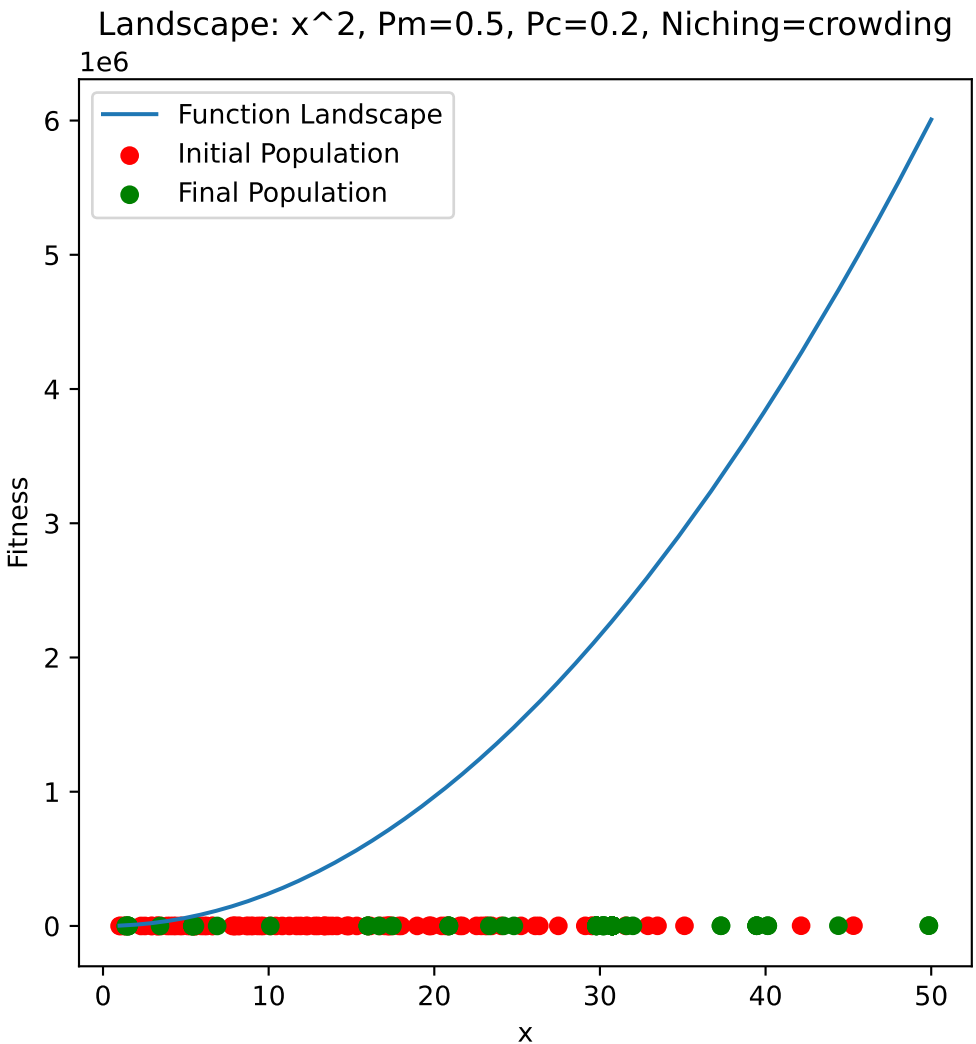
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.5, Pc=0.2, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
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20
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40
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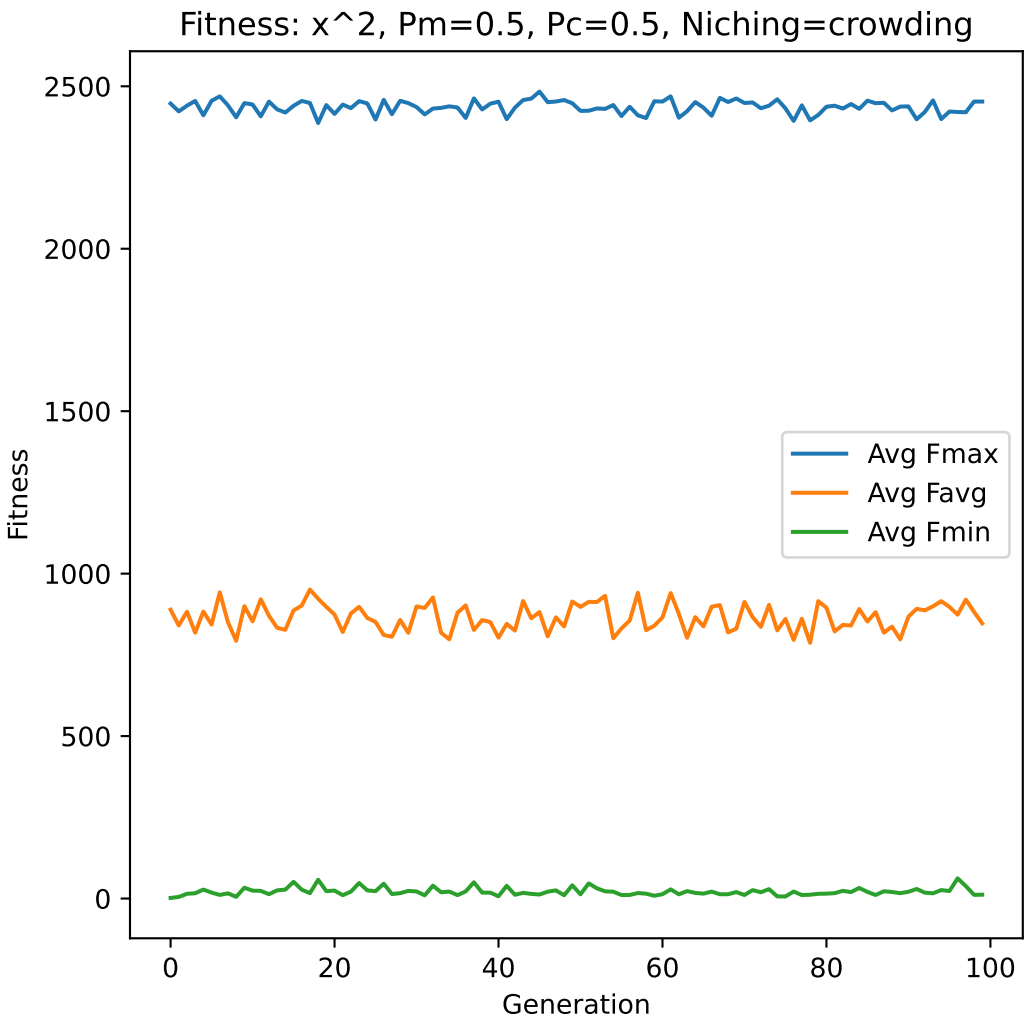
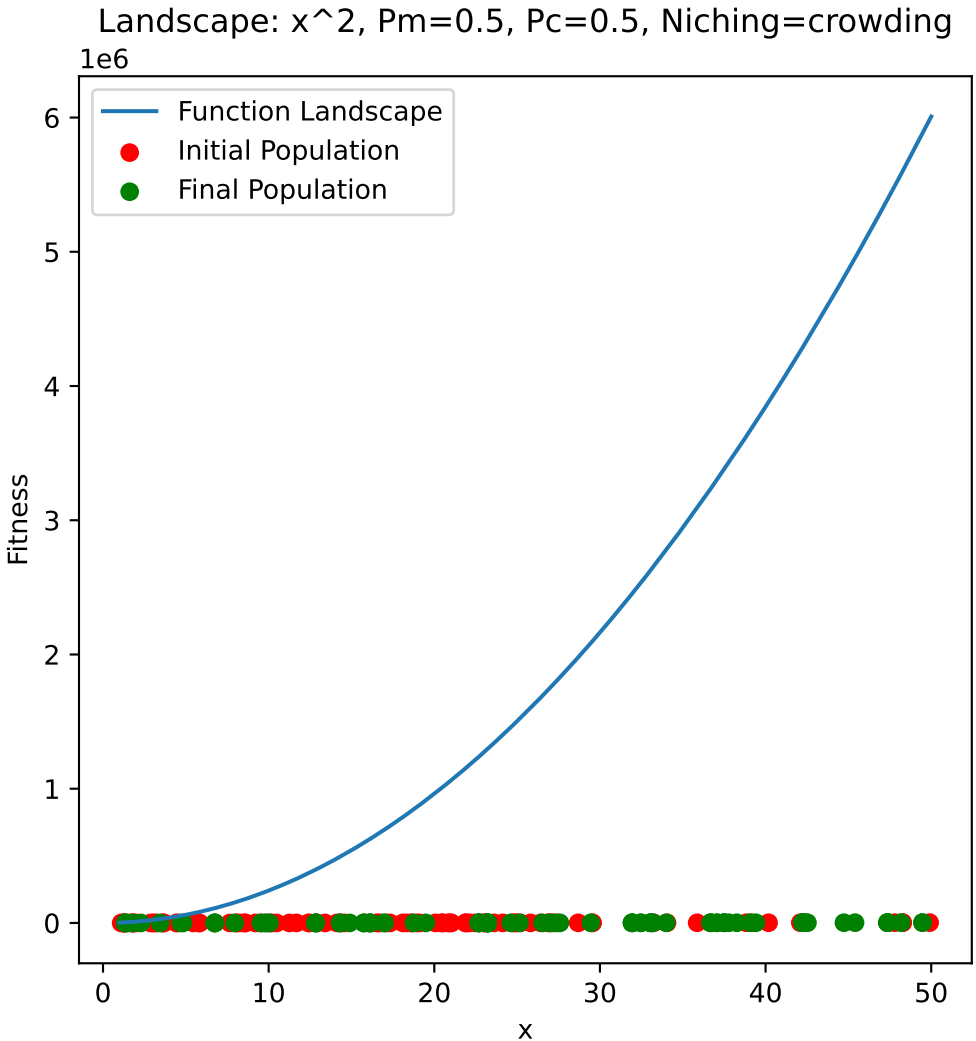

Fitness: x^2, Pm=0.5, Pc=0.5, Niching=crowding
2500
2000
1500
1000
500
0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.5, Pc=0.5, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
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5
6
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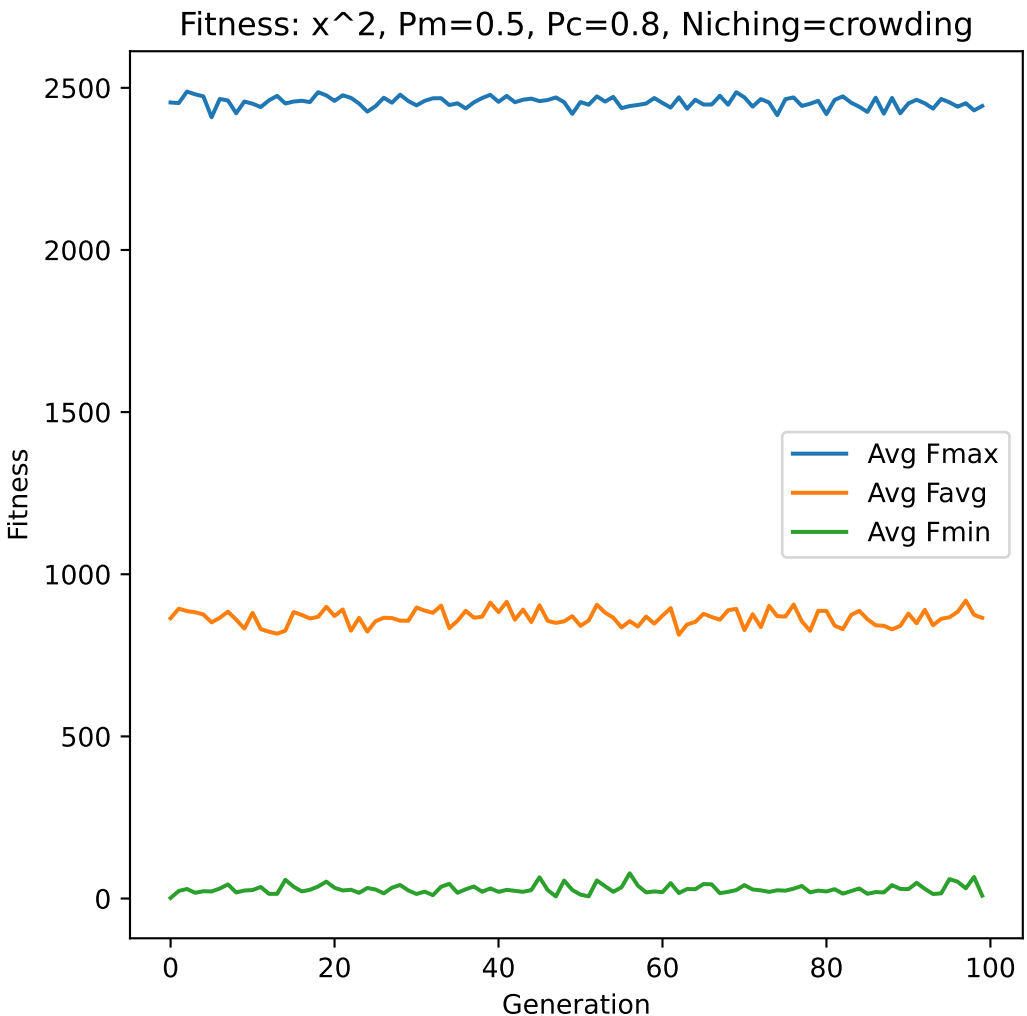
Fitness: x^2, Pm=0.5, Pc=0.8, Niching=crowding
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2000
1500
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500
0
Fitness
0
20
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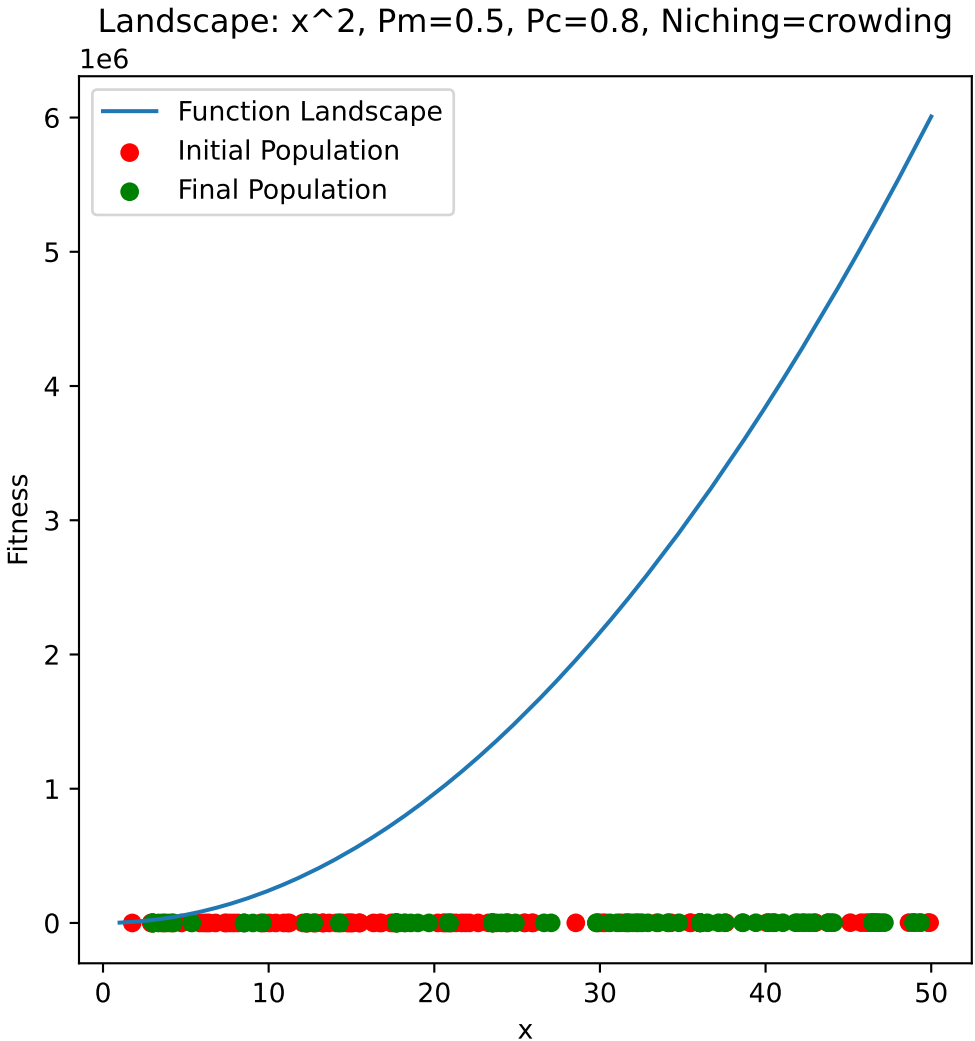
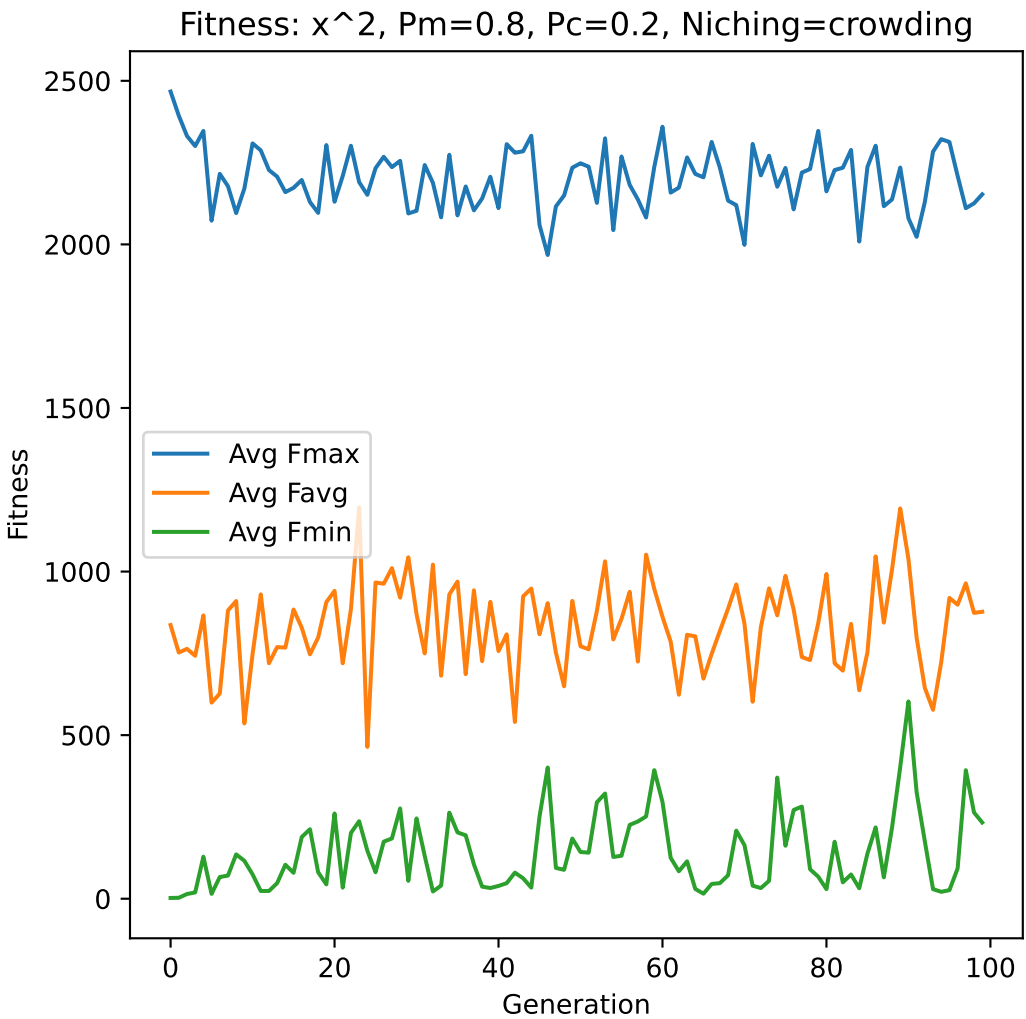
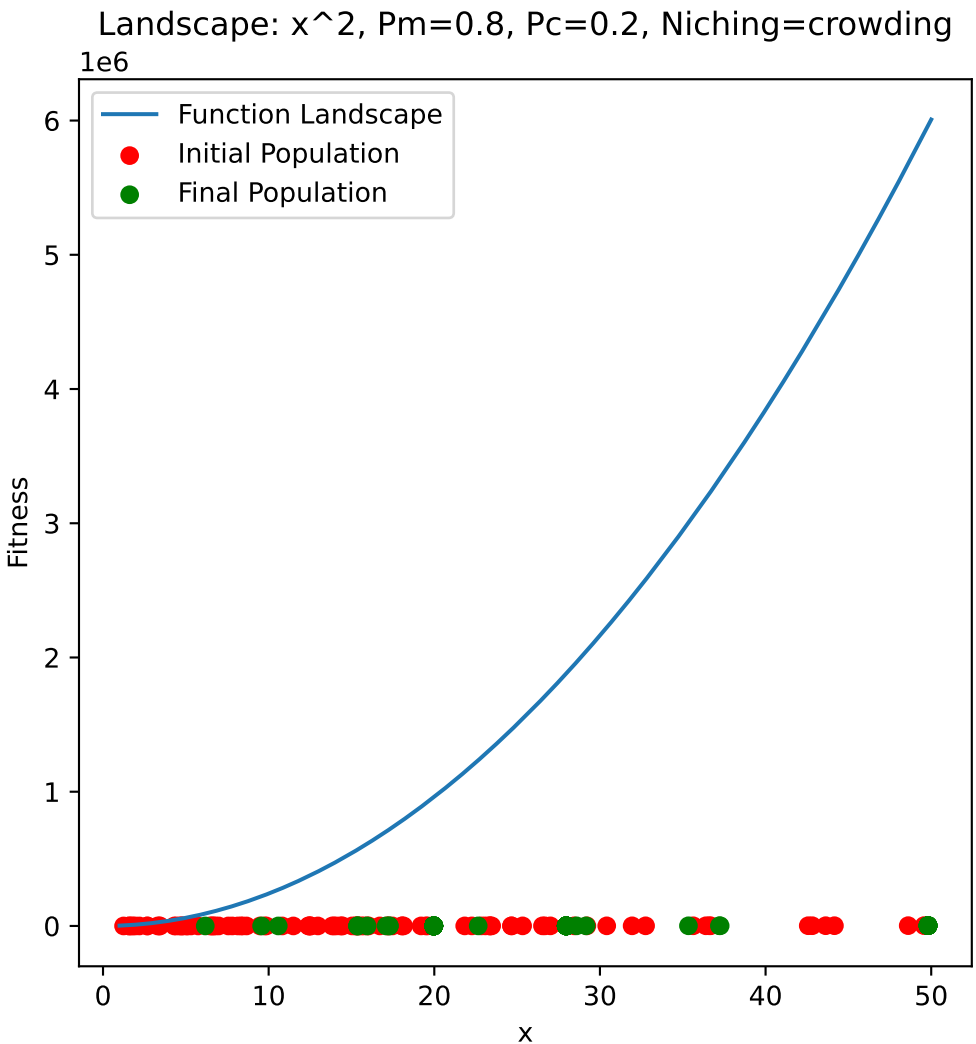
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.5, Pc=0.8, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
10
20
30
40
50


Fitness: x^2, Pm=0.8, Pc=0.2, Niching=crowding
2500
2000
1500
1000
500
0
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
20
40
60
80
100
Generation


Landscape: x^2, Pm=0.8, Pc=0.2, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
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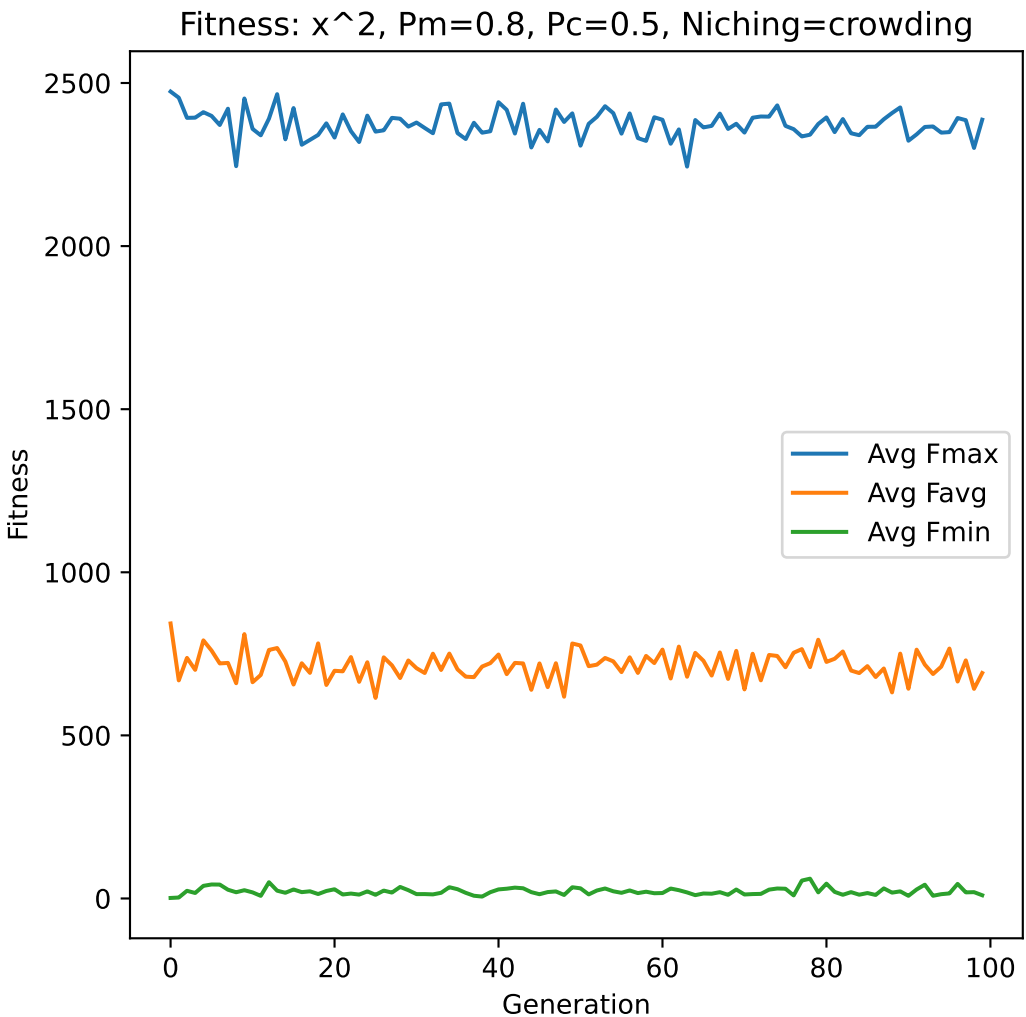
Fitness: x^2, Pm=0.8, Pc=0.5, Niching=crowding
2500
2000
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500
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Fitness
0
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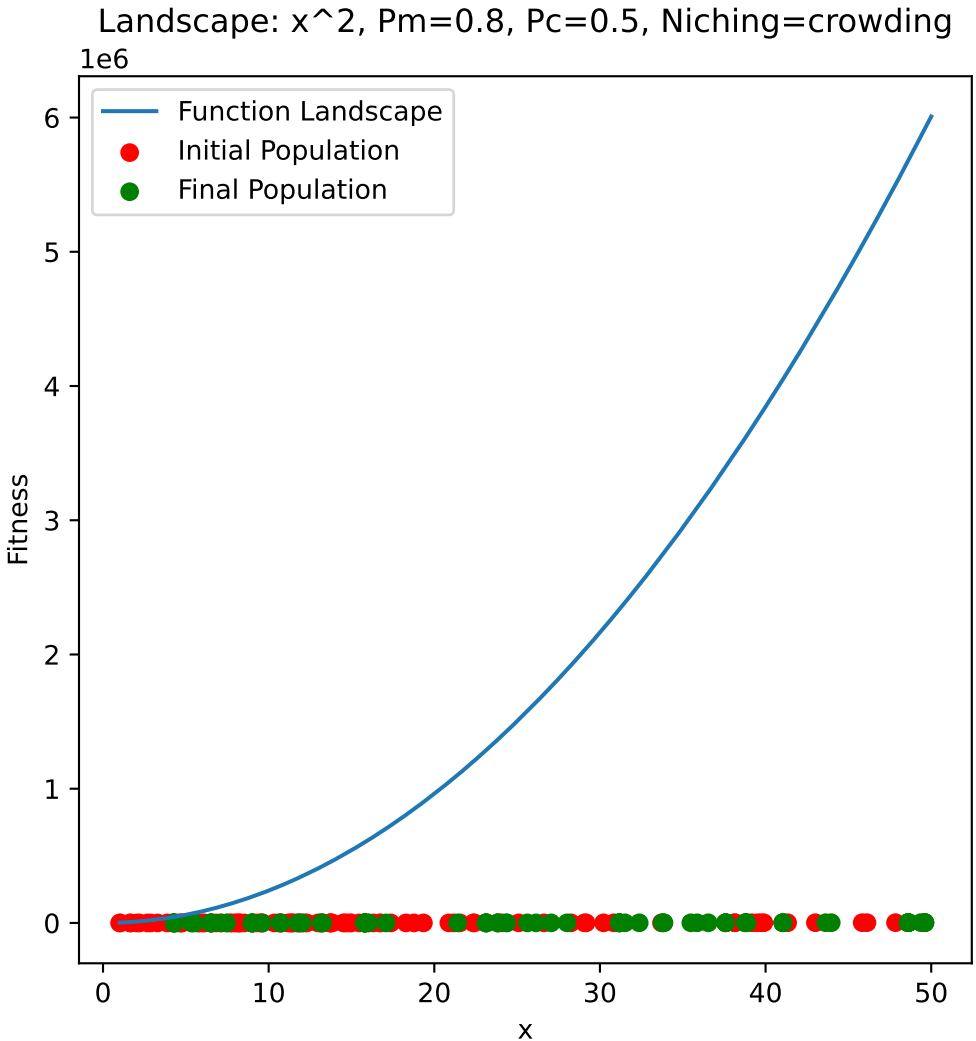
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: x^2, Pm=0.8, Pc=0.5, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
10
20
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40
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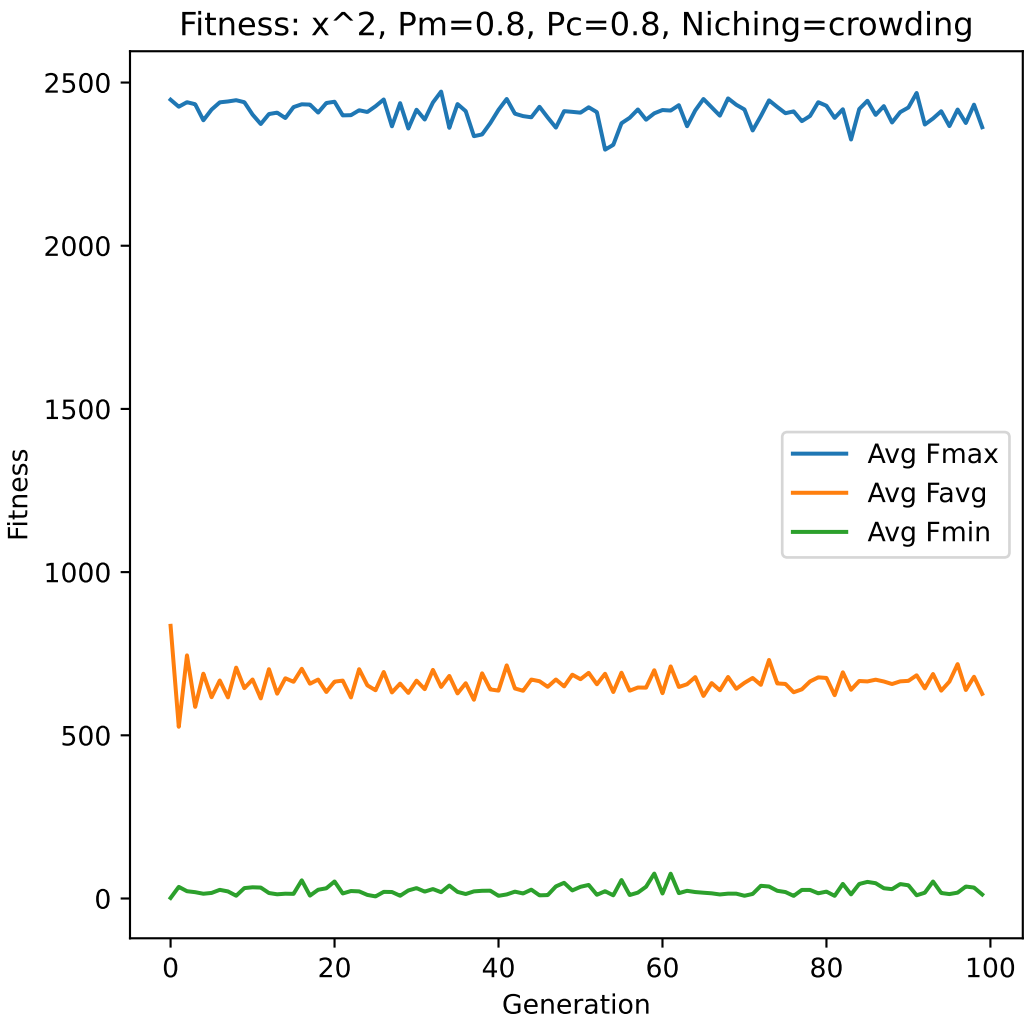
Fitness: x^2, Pm=0.8, Pc=0.8, Niching=crowding
2500
2000
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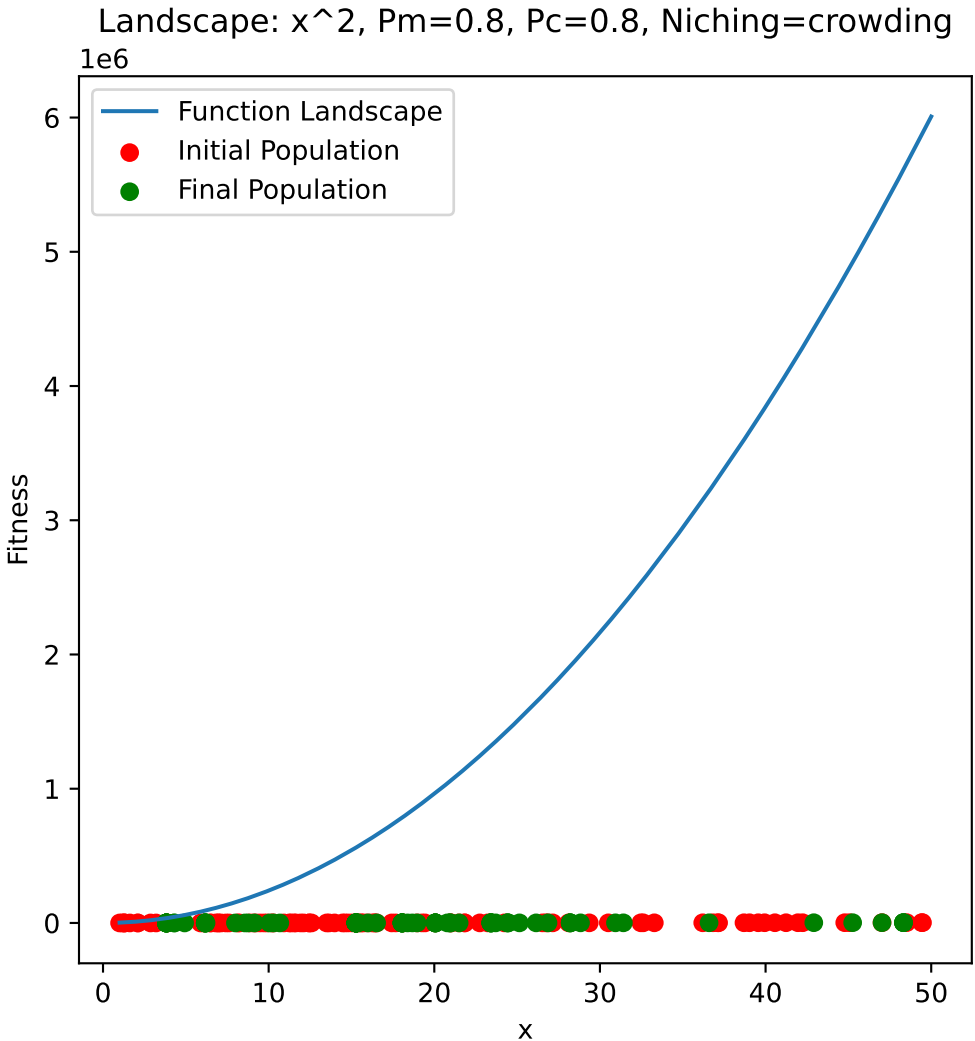
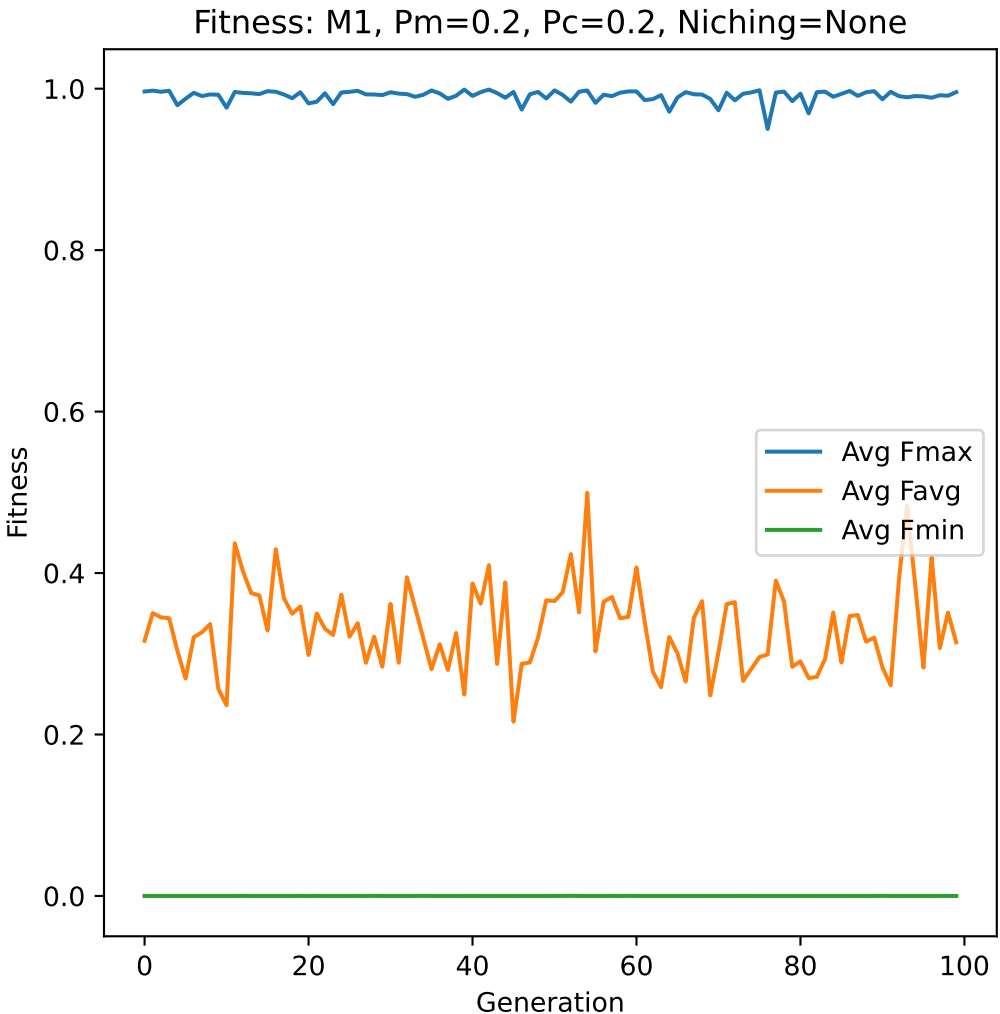
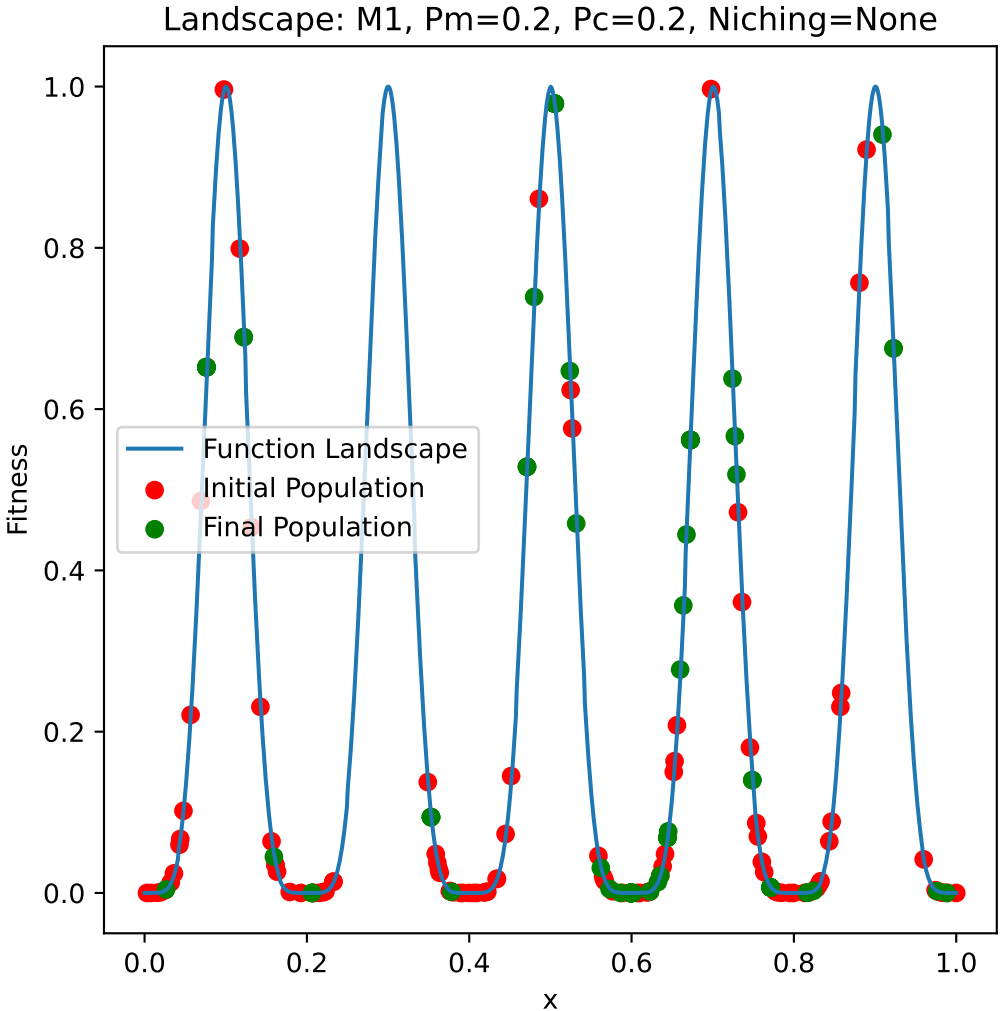
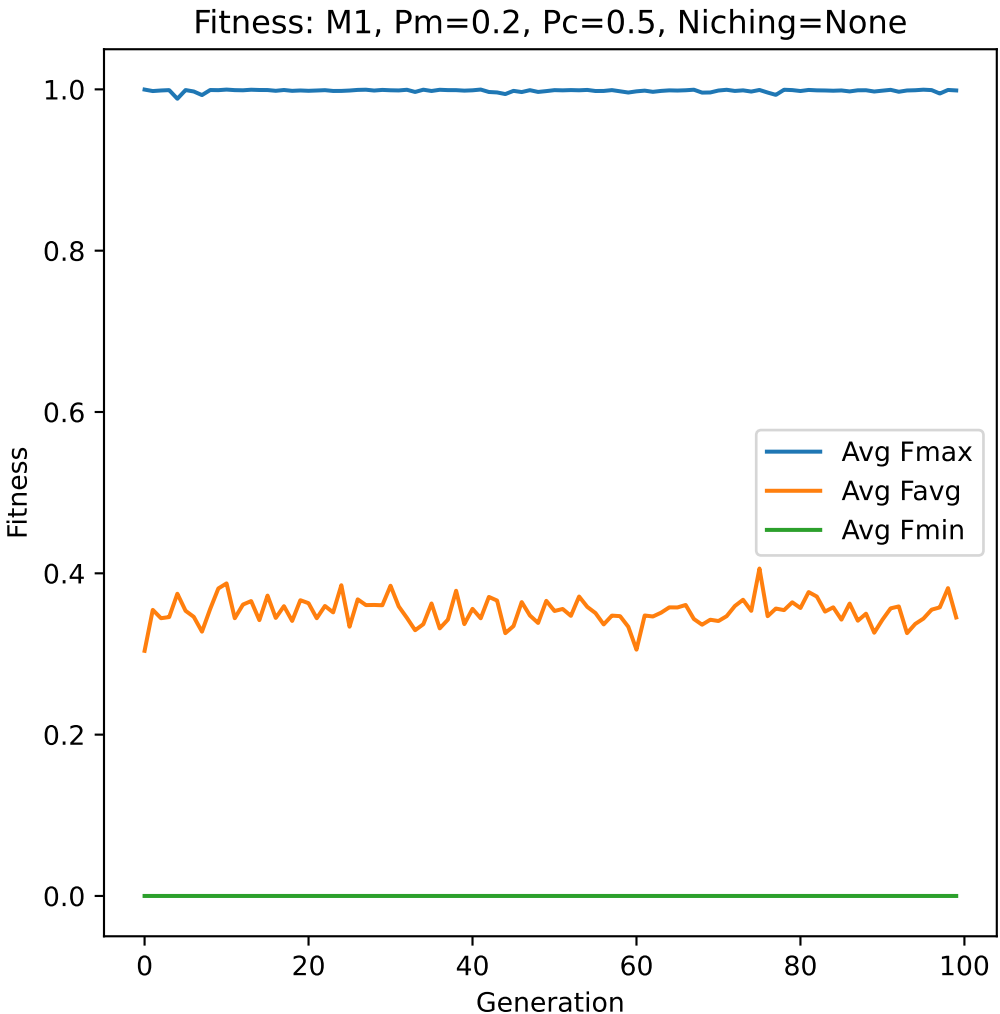
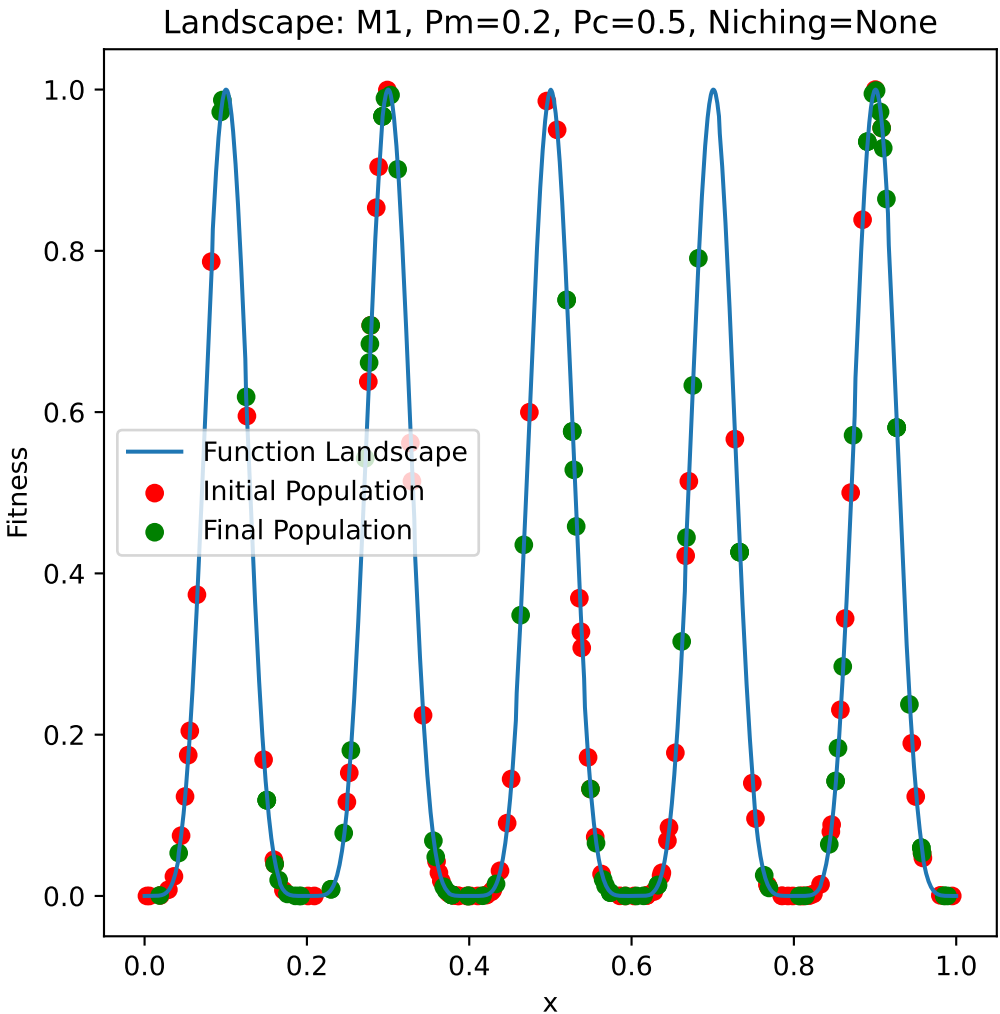
0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

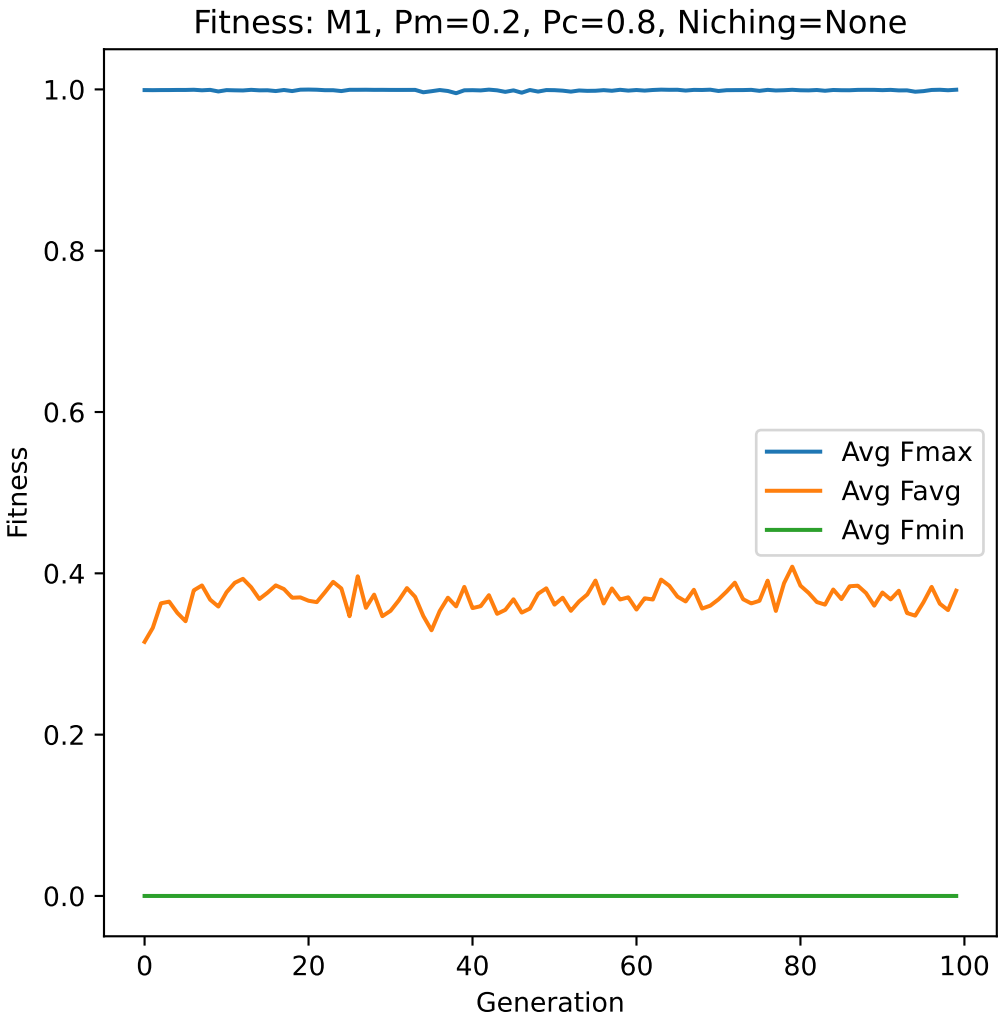

Landscape: x^2, Pm=0.8, Pc=0.8, Niching=crowding
1e6
Function Landscape
Initial Population
Final Population
Fitness
x
0
1
2
3
4
5
6
0
10
20
30
40
50


Fitness: M1, Pm=0.2, Pc=0.2, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M1, Pm=0.2, Pc=0.2, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M1, Pm=0.2, Pc=0.5, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M1, Pm=0.2, Pc=0.5, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M1, Pm=0.2, Pc=0.8, Niching=None
1.0
0.8
0.6
0.4
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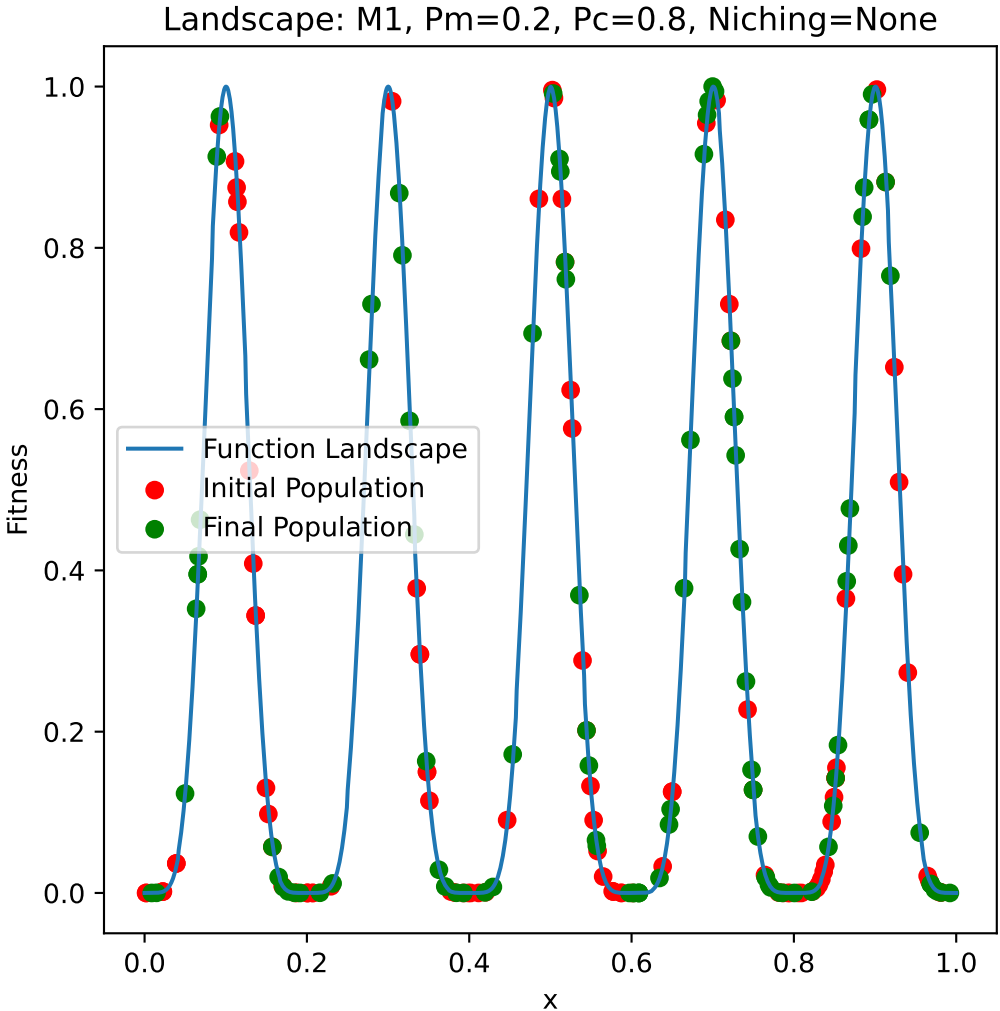
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin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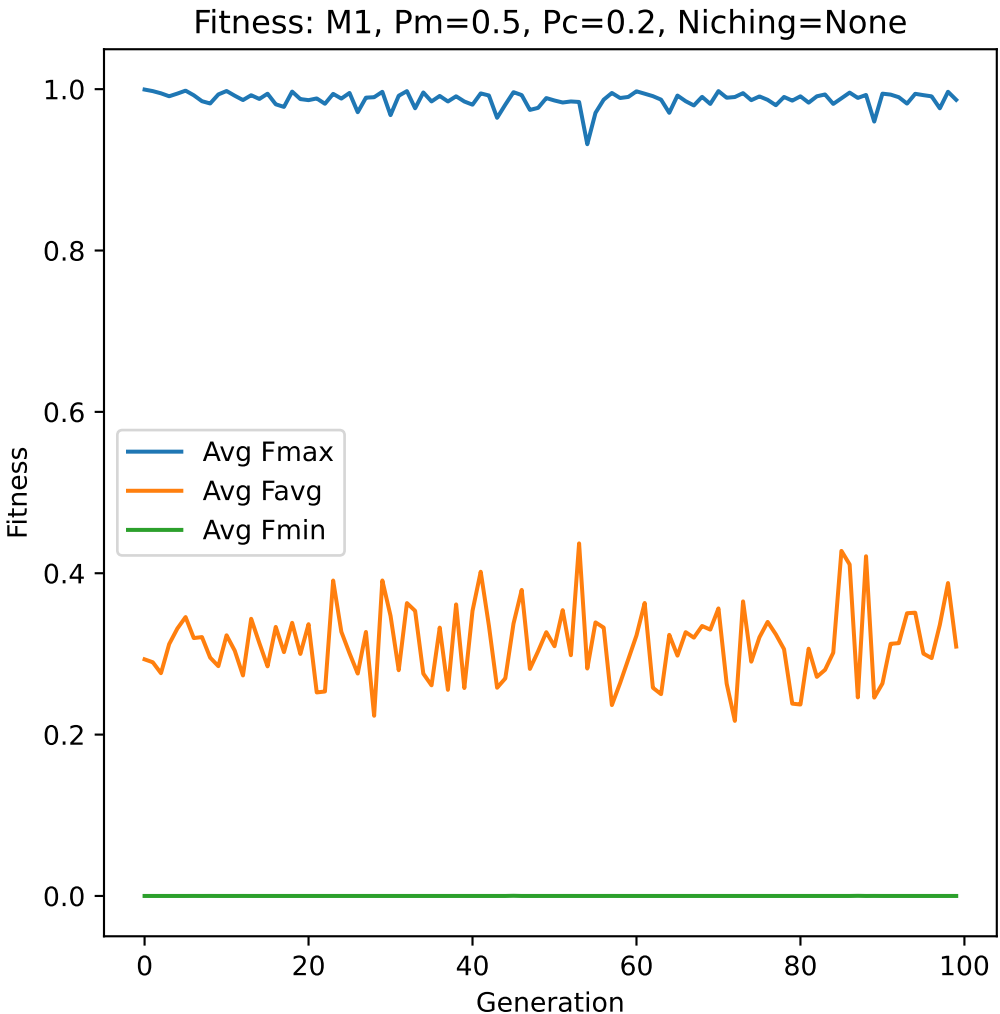
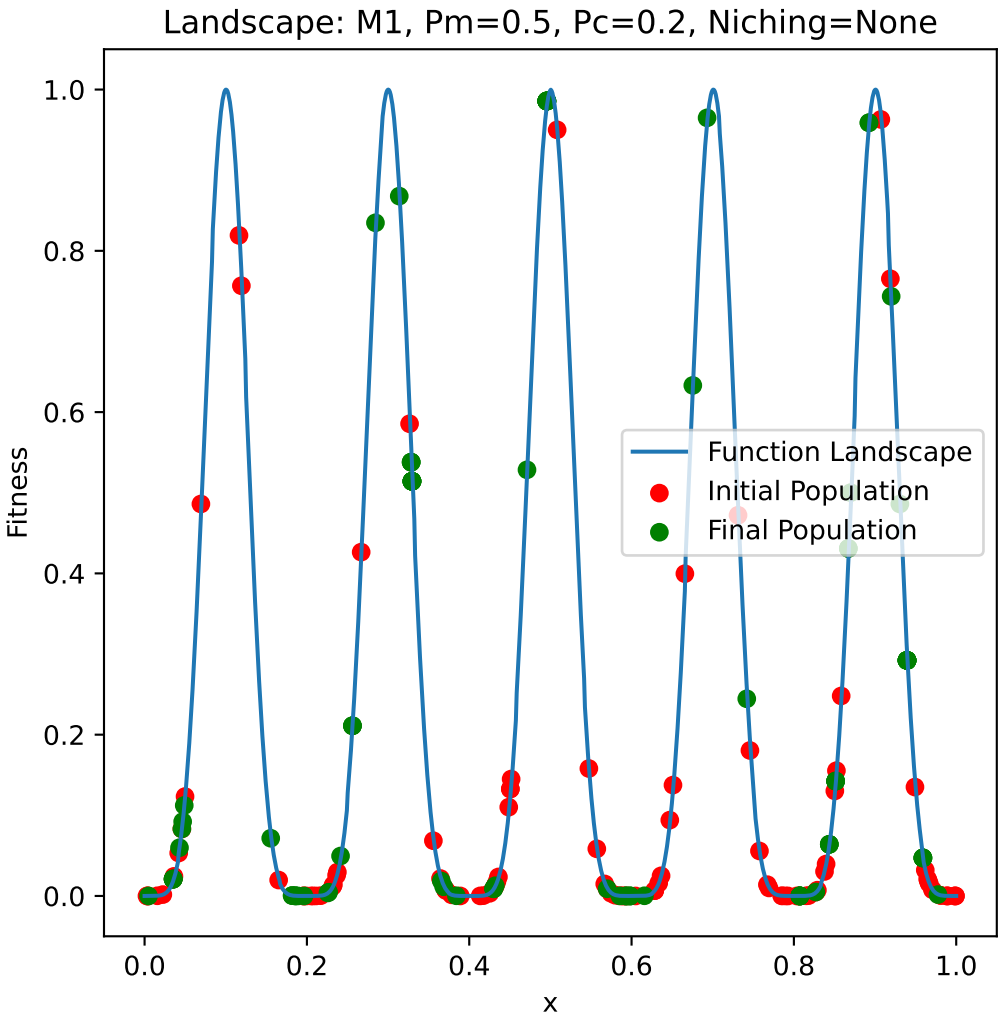
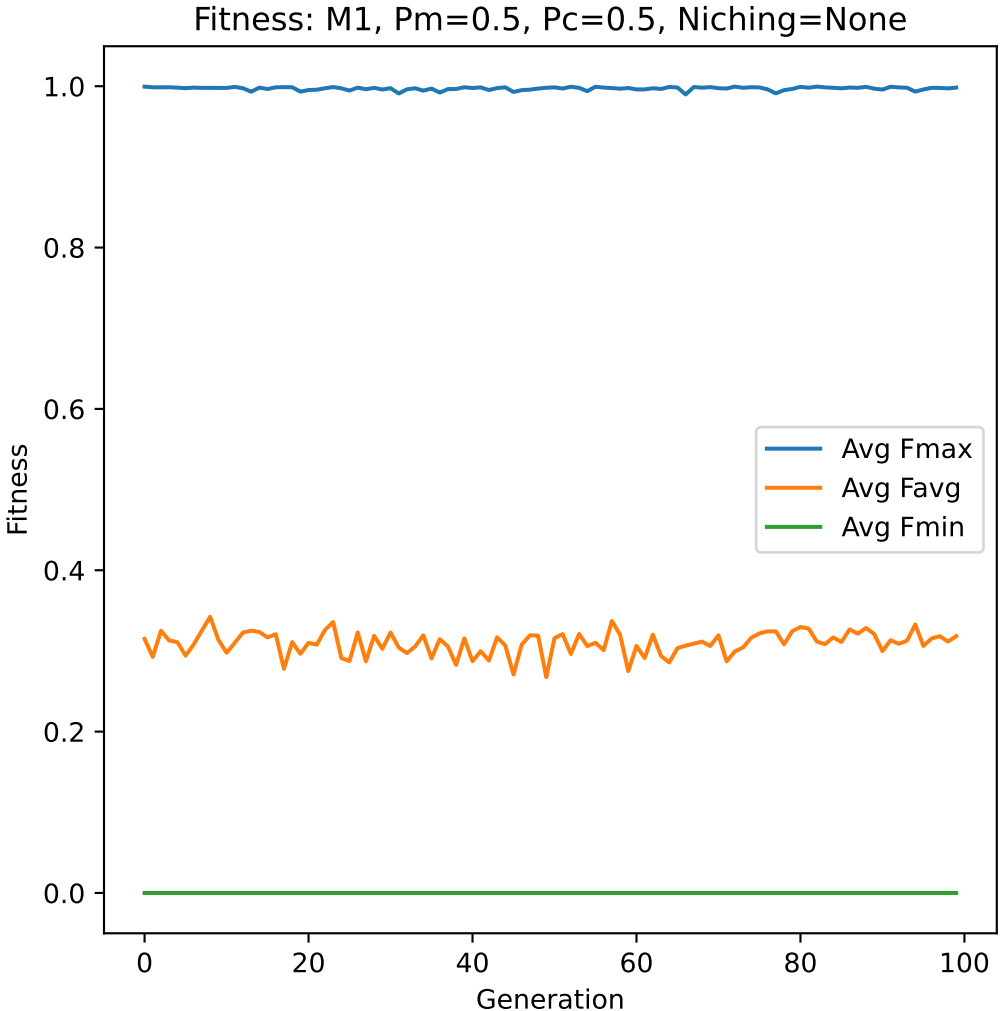
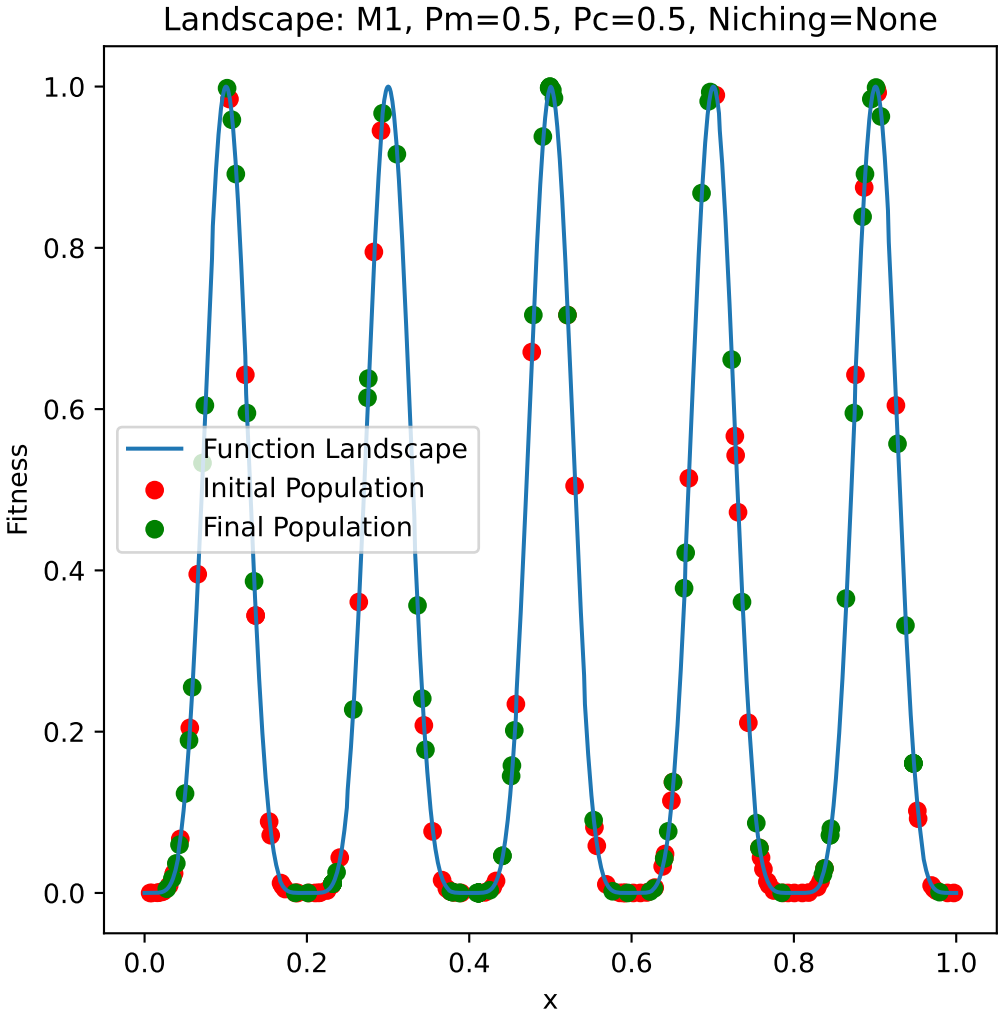
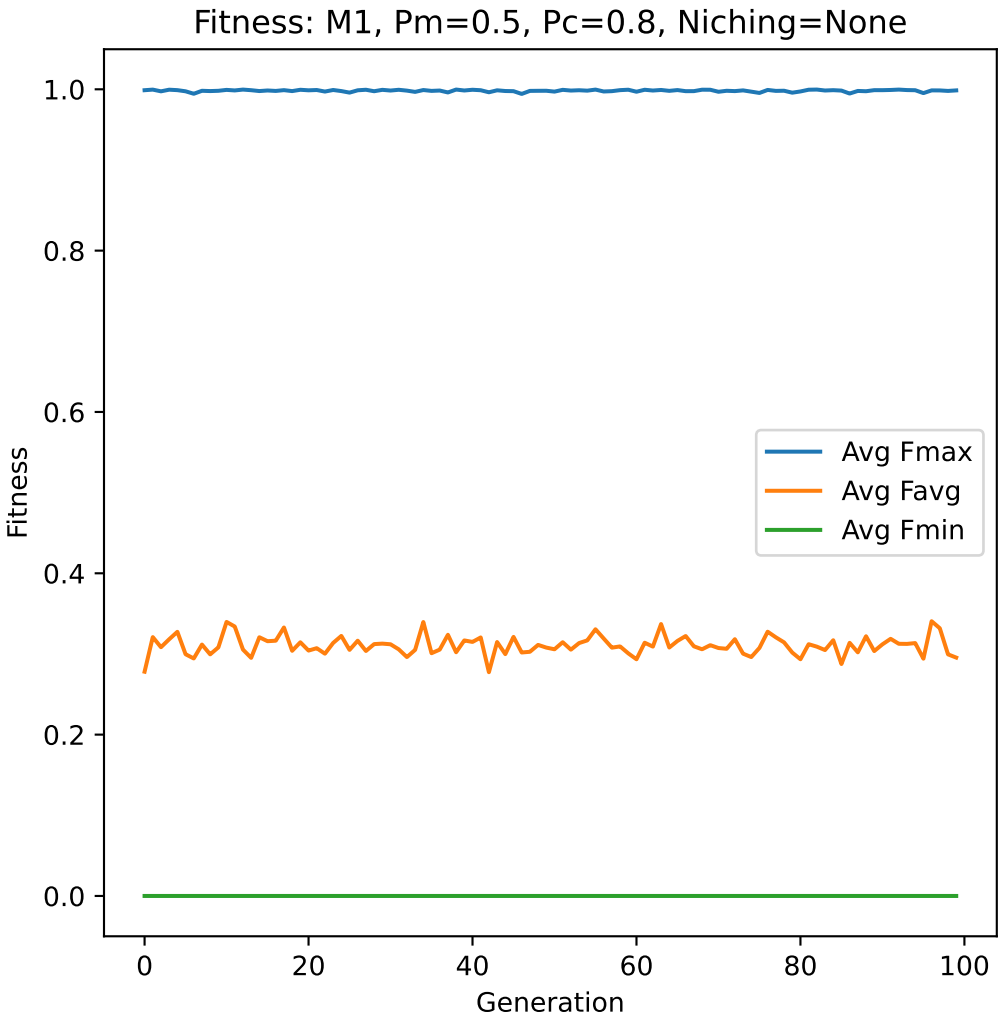
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M1, Pm=0.5, Pc=0.2, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
20
40
60
80
100
Generation


Landscape: M1, Pm=0.5, Pc=0.2, Niching=None
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population


Fitness: M1, Pm=0.5, Pc=0.5, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M1, Pm=0.5, Pc=0.5, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0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0.8
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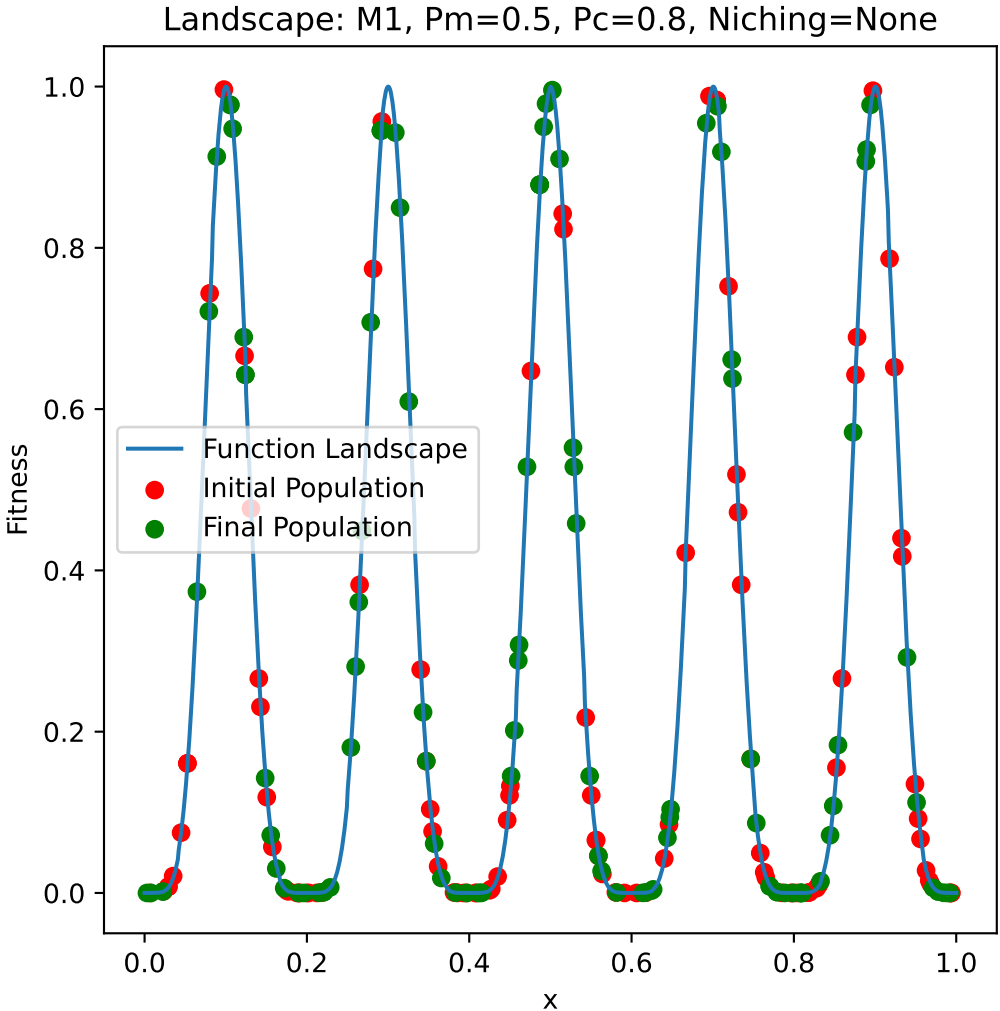
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M1, Pm=0.5, Pc=0.8, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
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0.2
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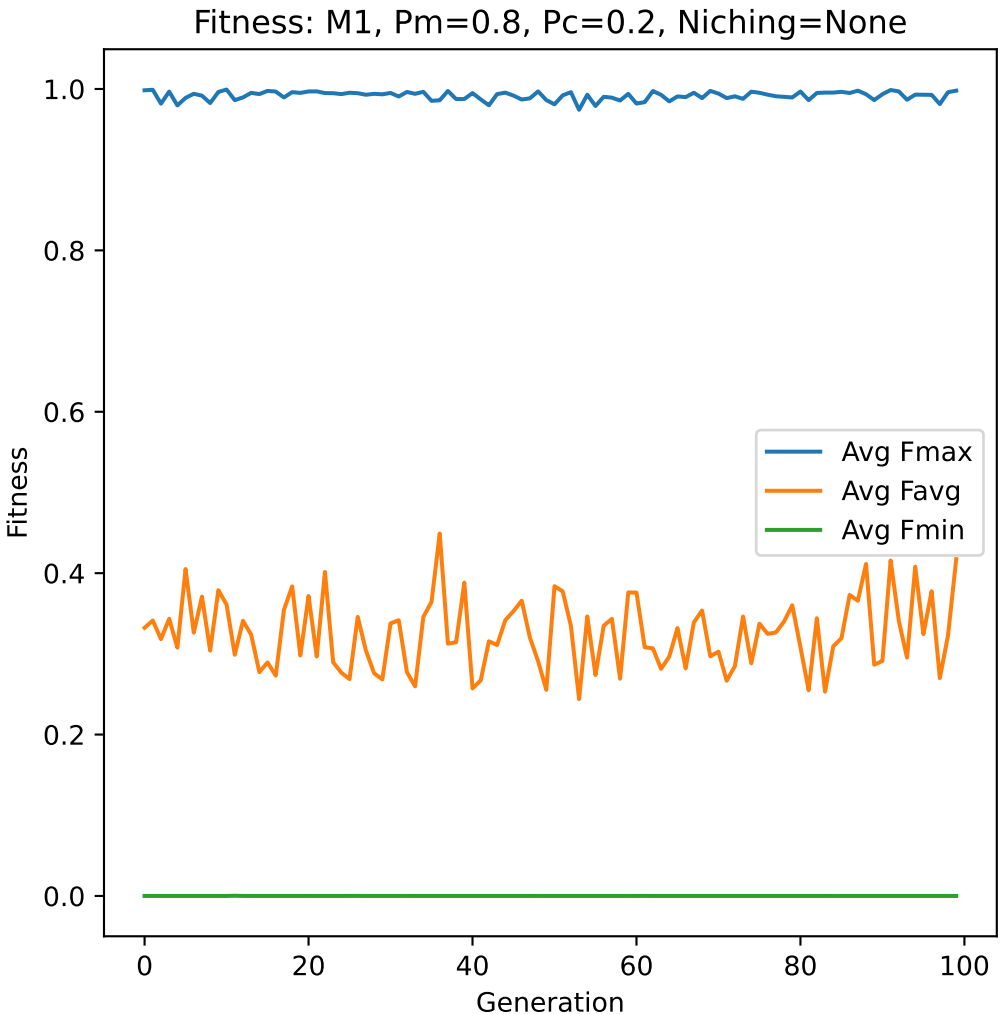
0.8
1.0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0.8
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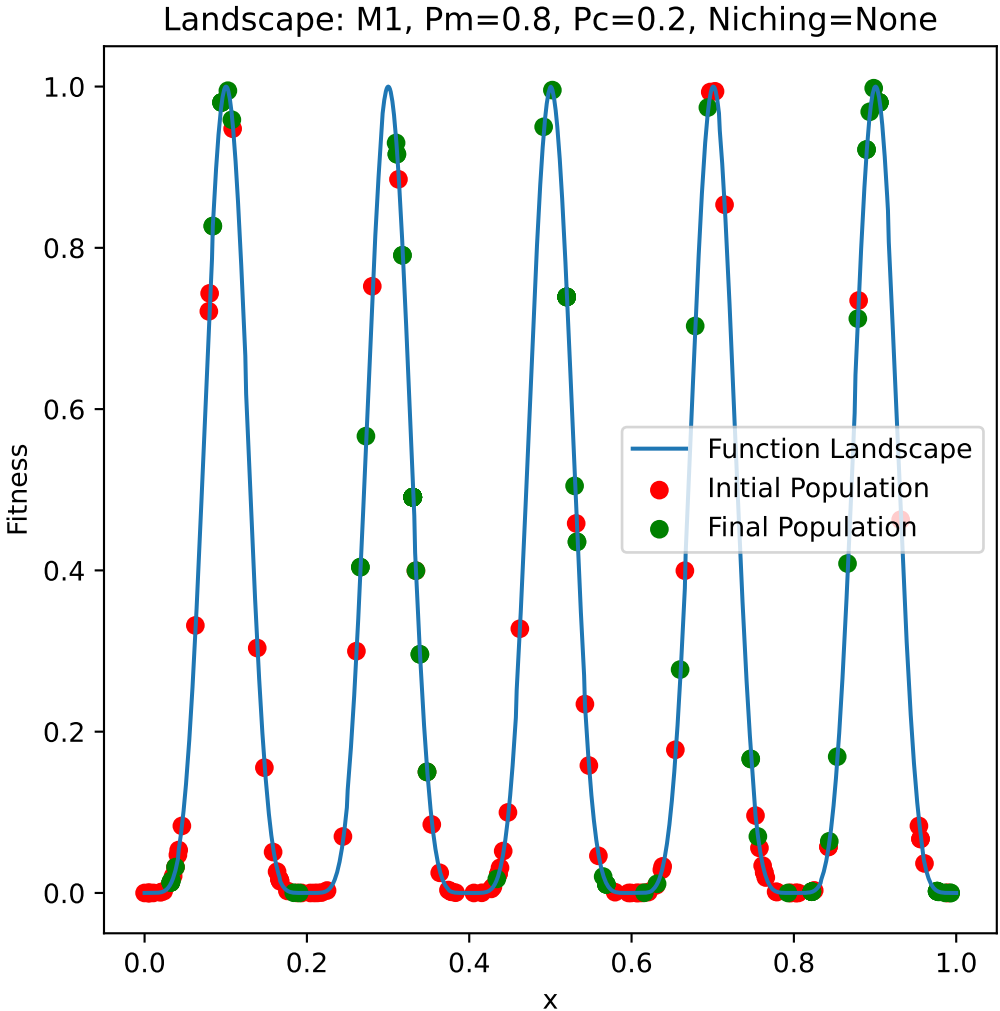
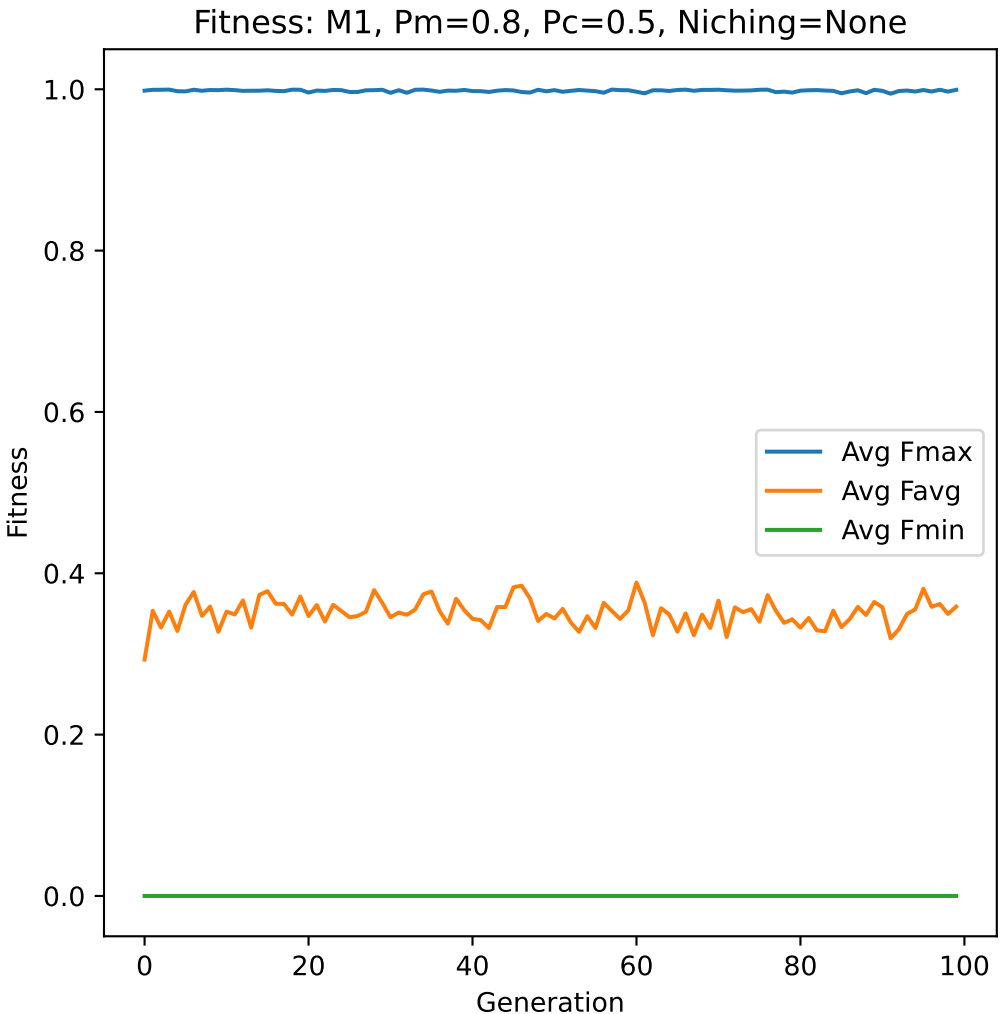
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M1, Pm=0.8, Pc=0.2, Niching=None
Fitness
x
Function Landscape
Initial Population
Final Population
0.0
0.2
0.4
0.6
0.8
1.0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1.0
0.8
0.6
0.4
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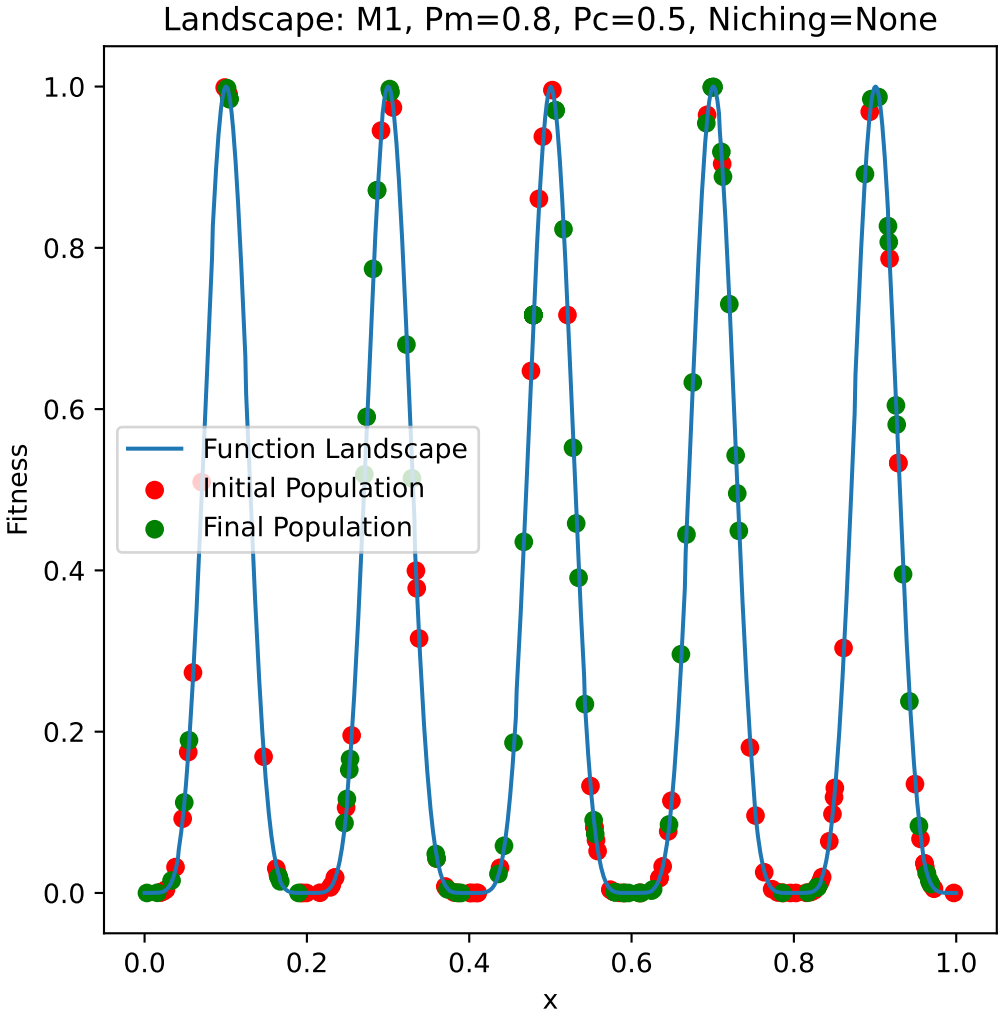
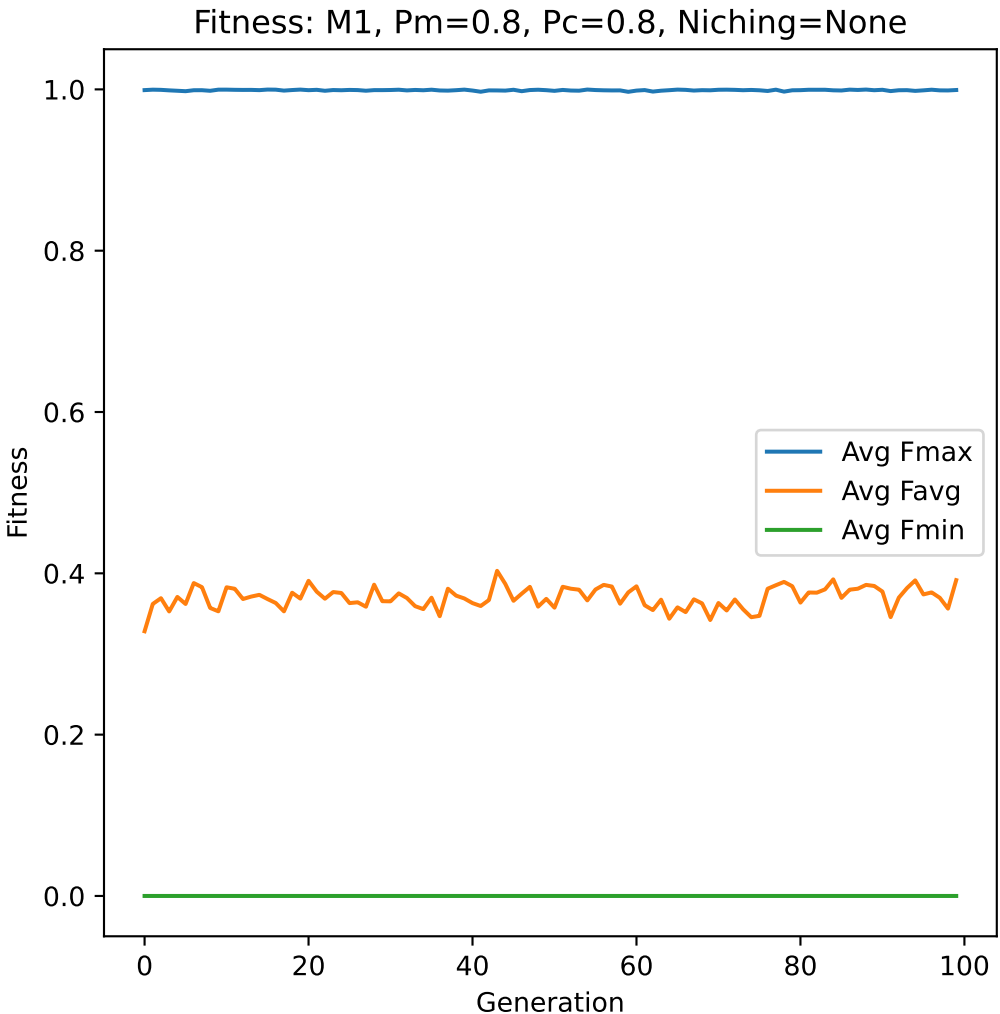
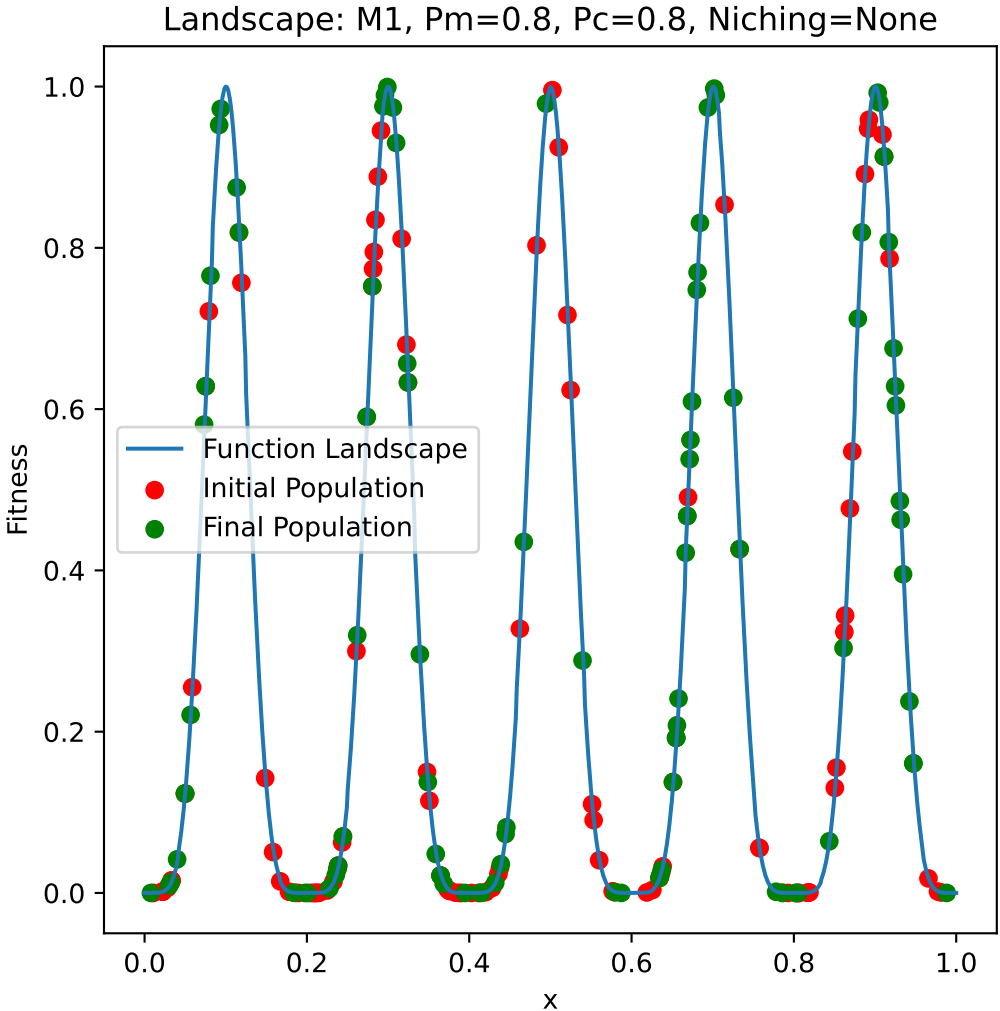
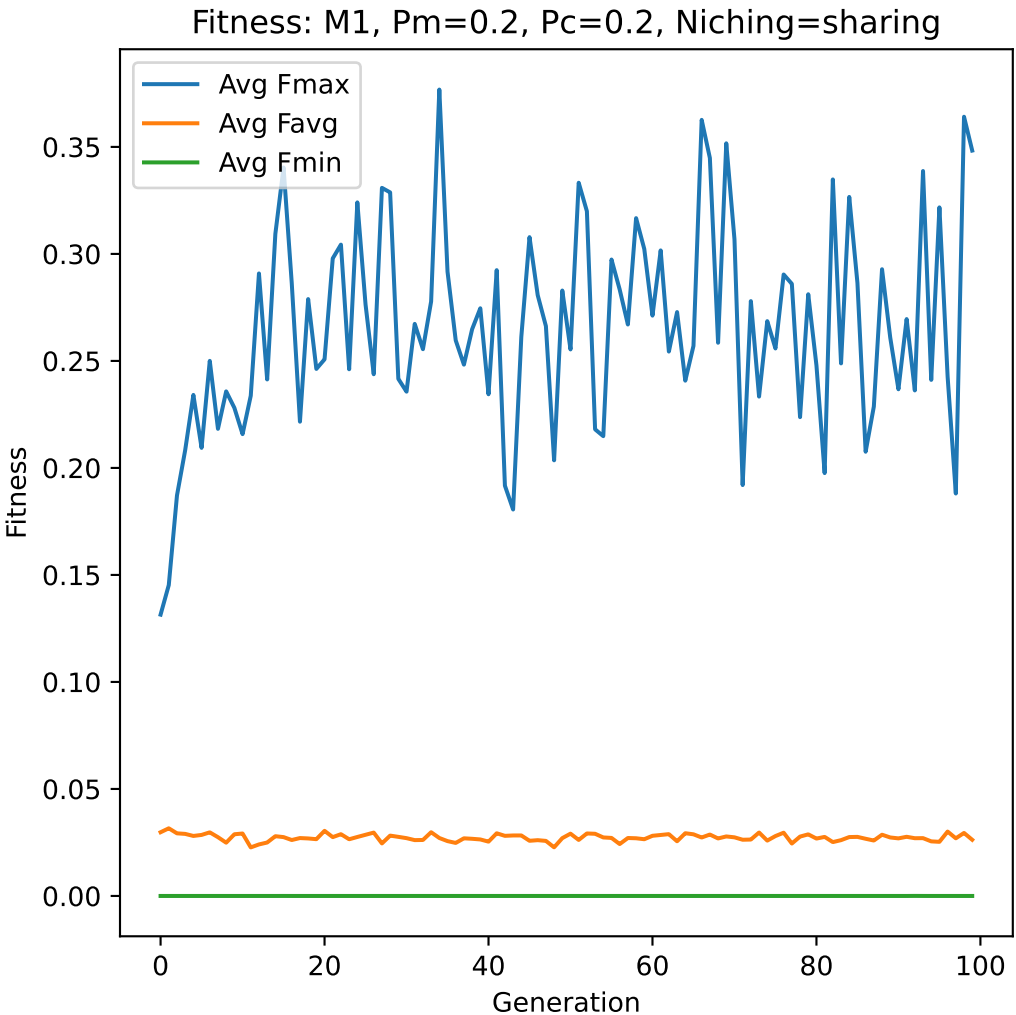
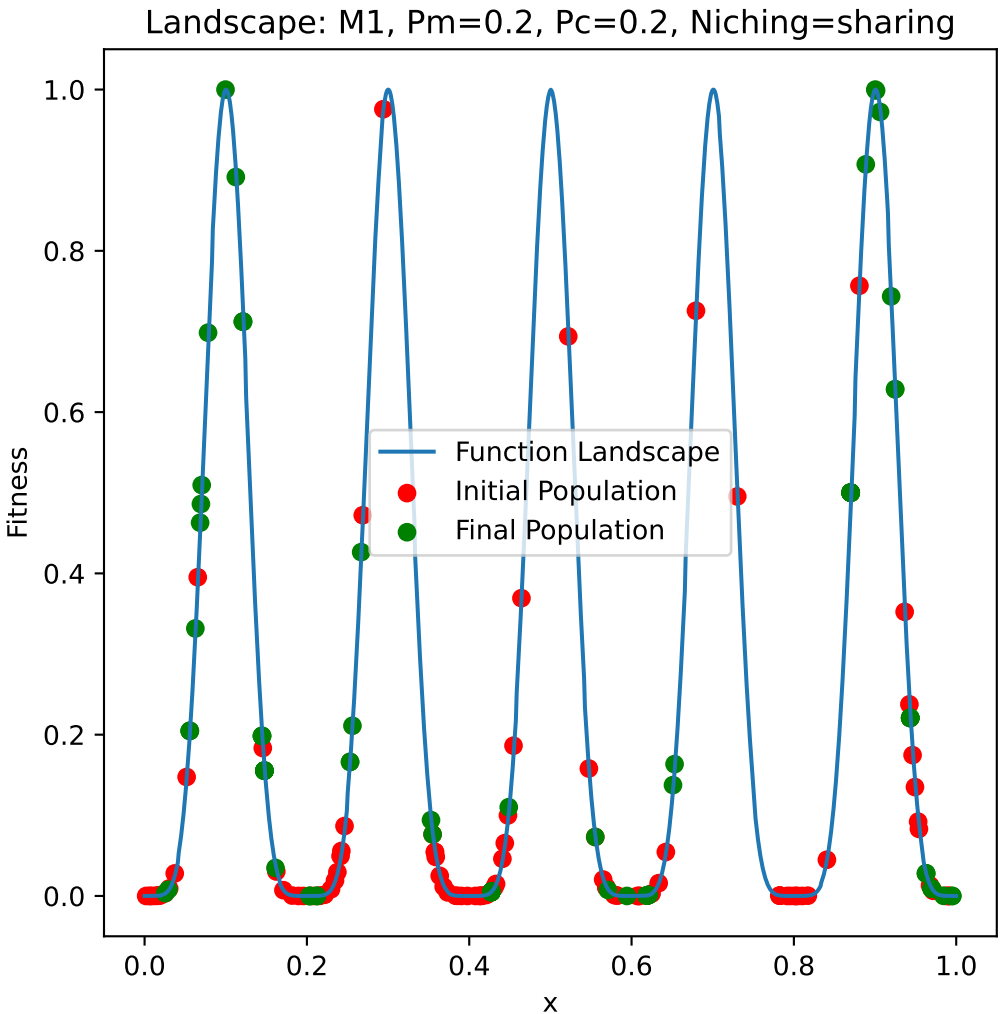
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

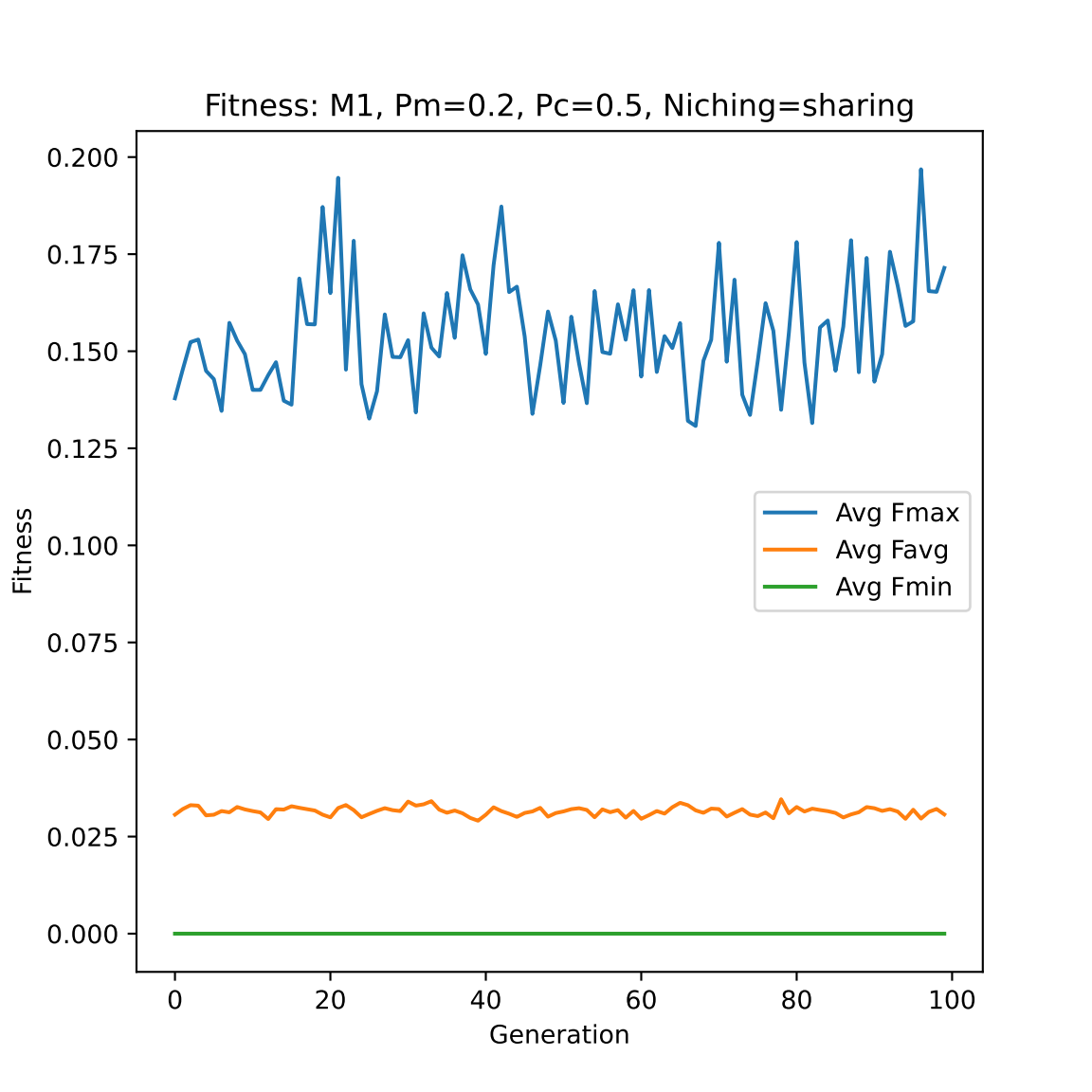

Landscape: M1, Pm=0.8, Pc=0.5, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

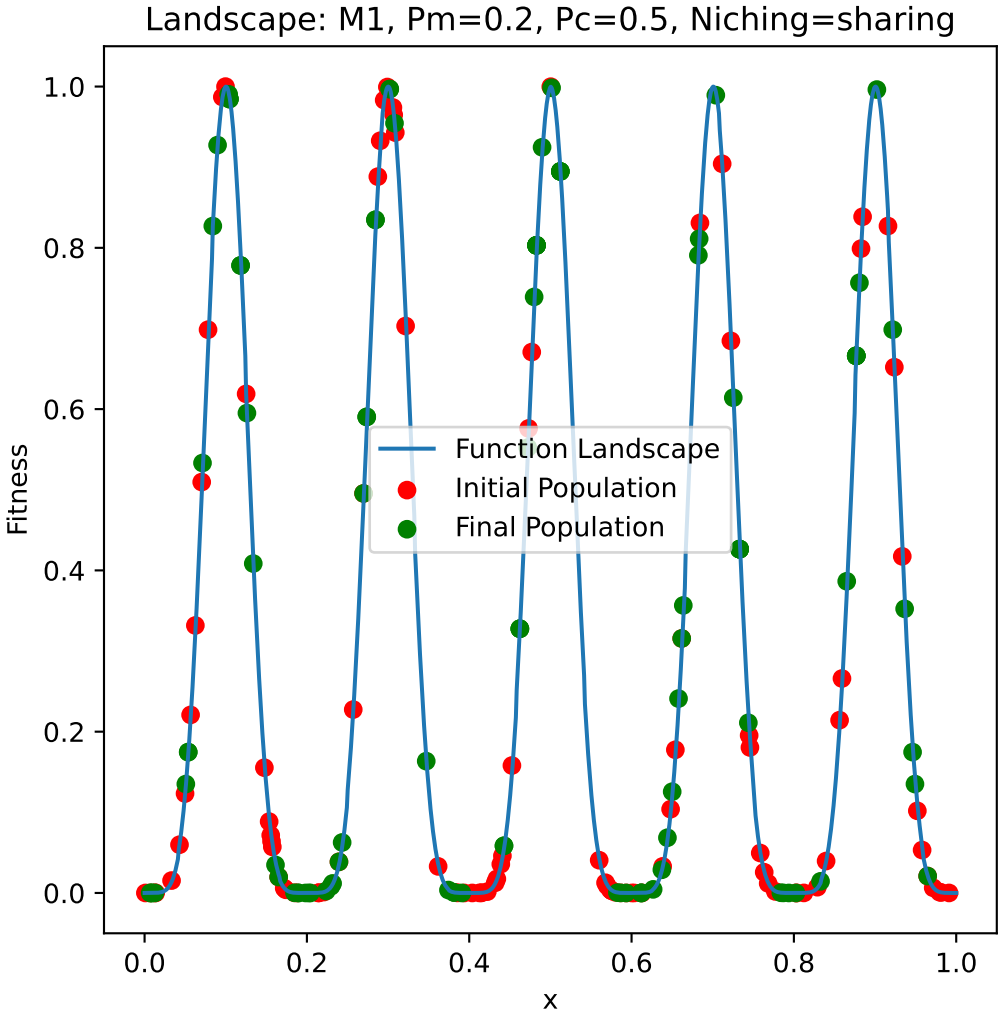

Fitness: M1, Pm=0.8, Pc=0.8, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

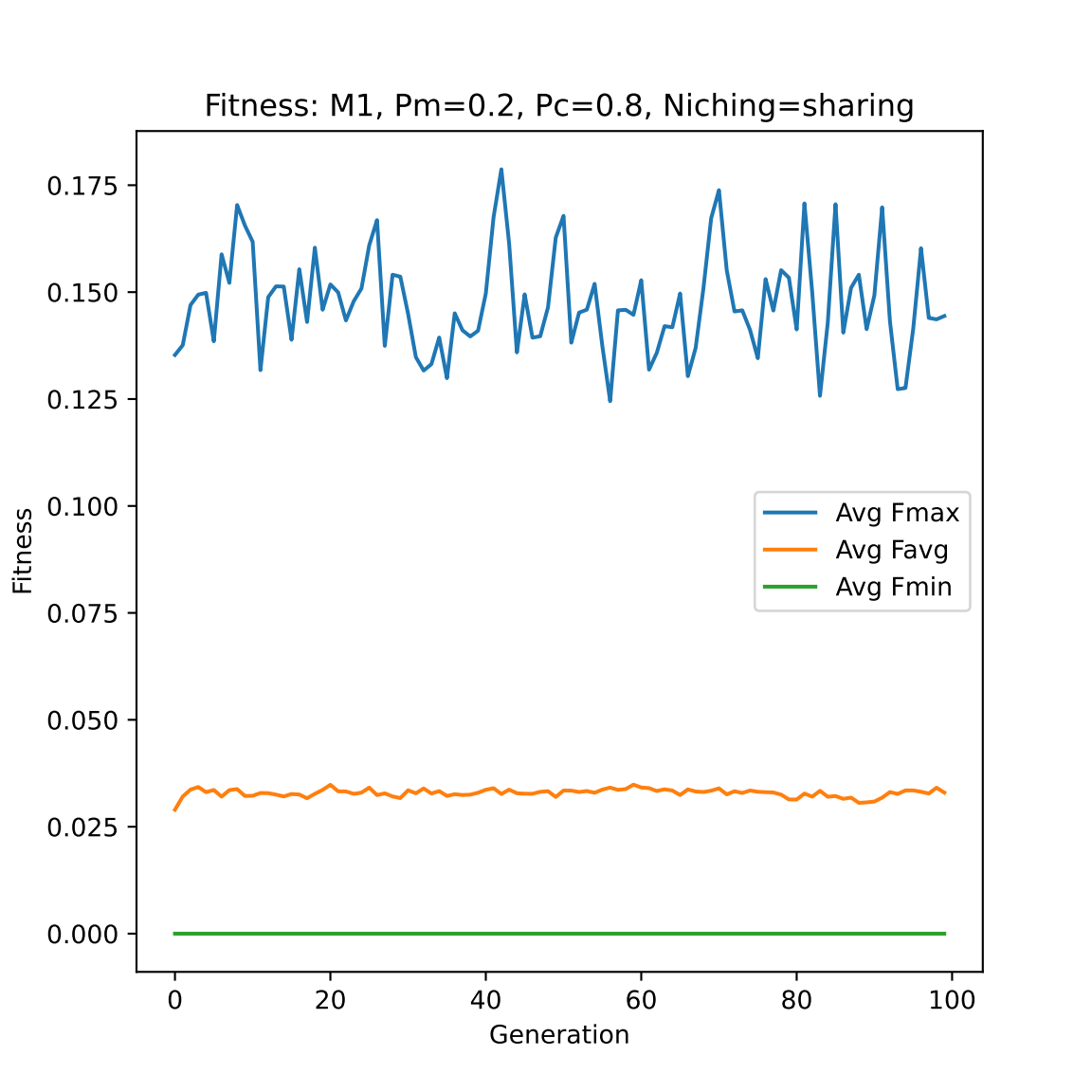

Landscape: M1, Pm=0.8, Pc=0.8, Niching=None
Fitness
x
Function Landscape
Initial Population
Final Population
0.0
0.2
0.4
0.6
0.8
1.0

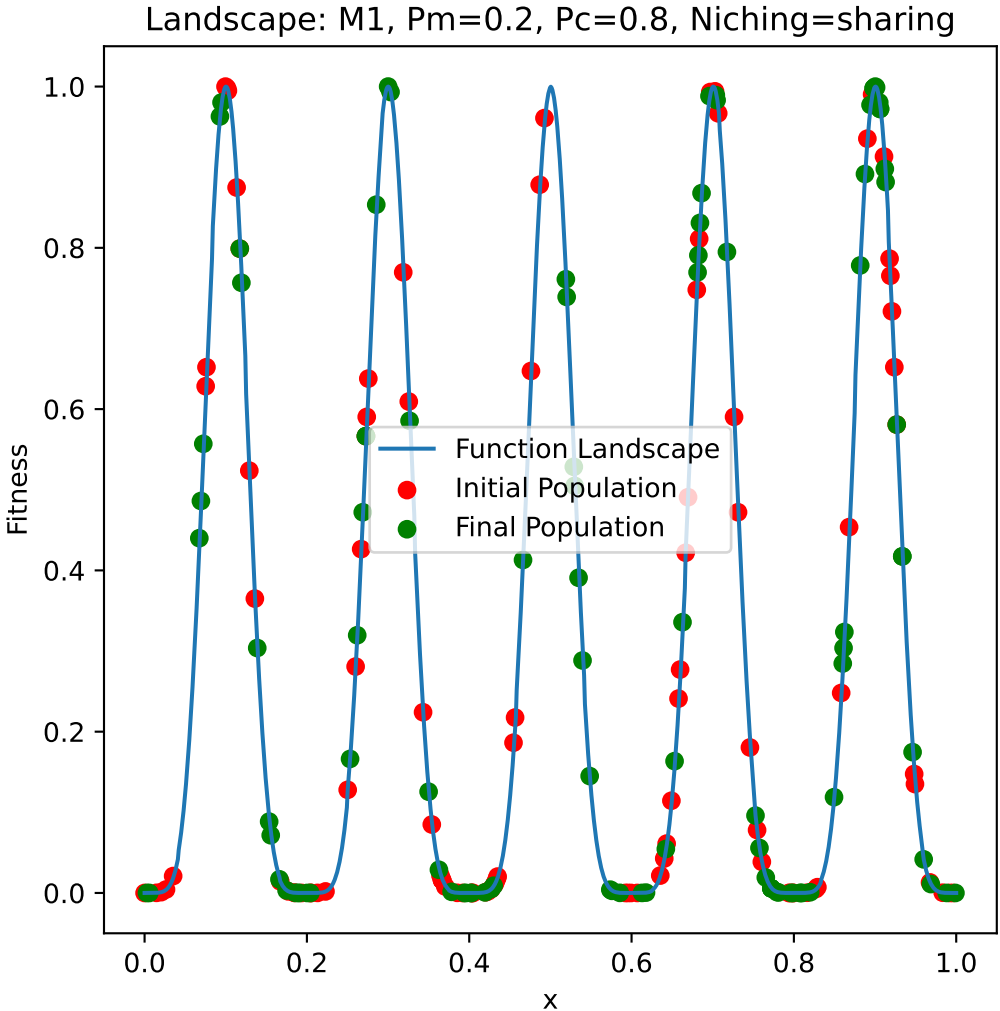

Fitness: M1, Pm=0.2, Pc=0.2, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
Fitness
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0
20
40
60
80
100
Generation

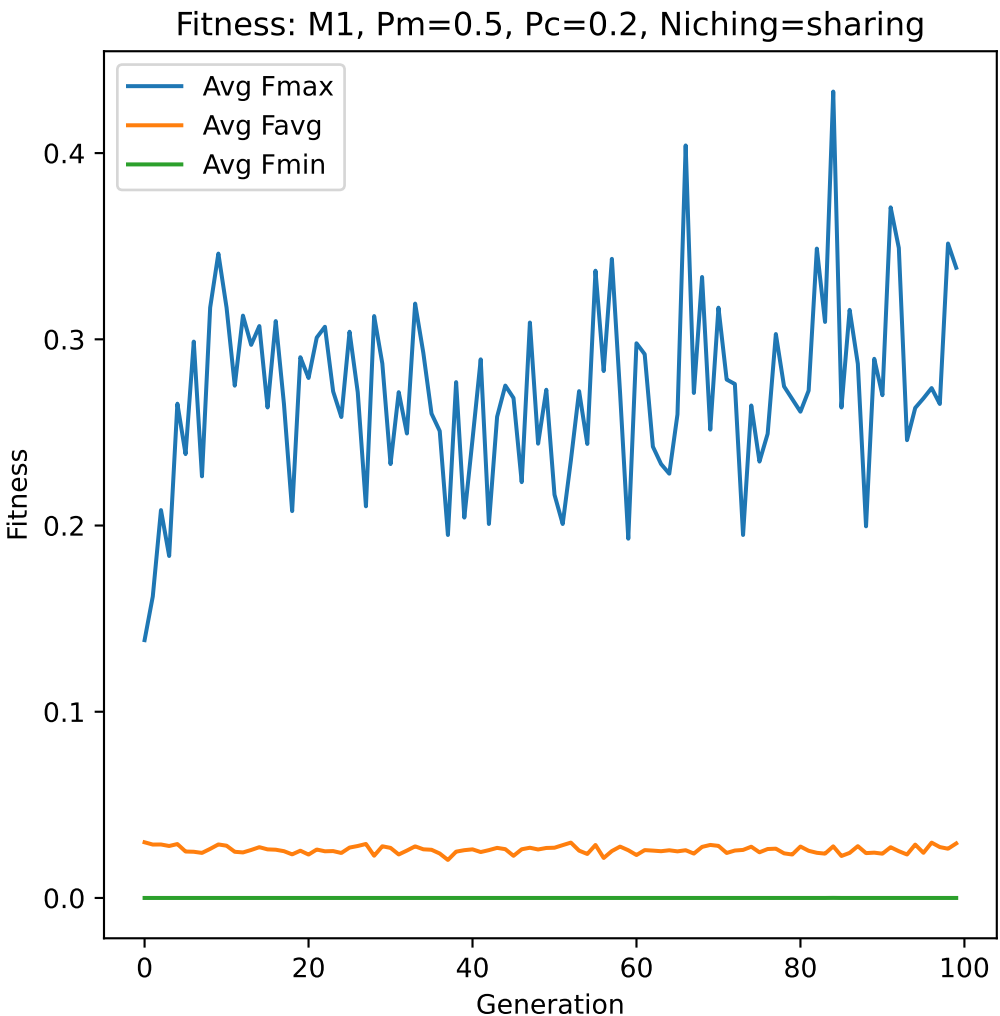

Landscape: M1, Pm=0.2, Pc=0.2, Niching=sharing
Fitness
x
Function Landscape
Initial Population
Final Population
0.0
0.2
0.4
0.6
0.8
1.0

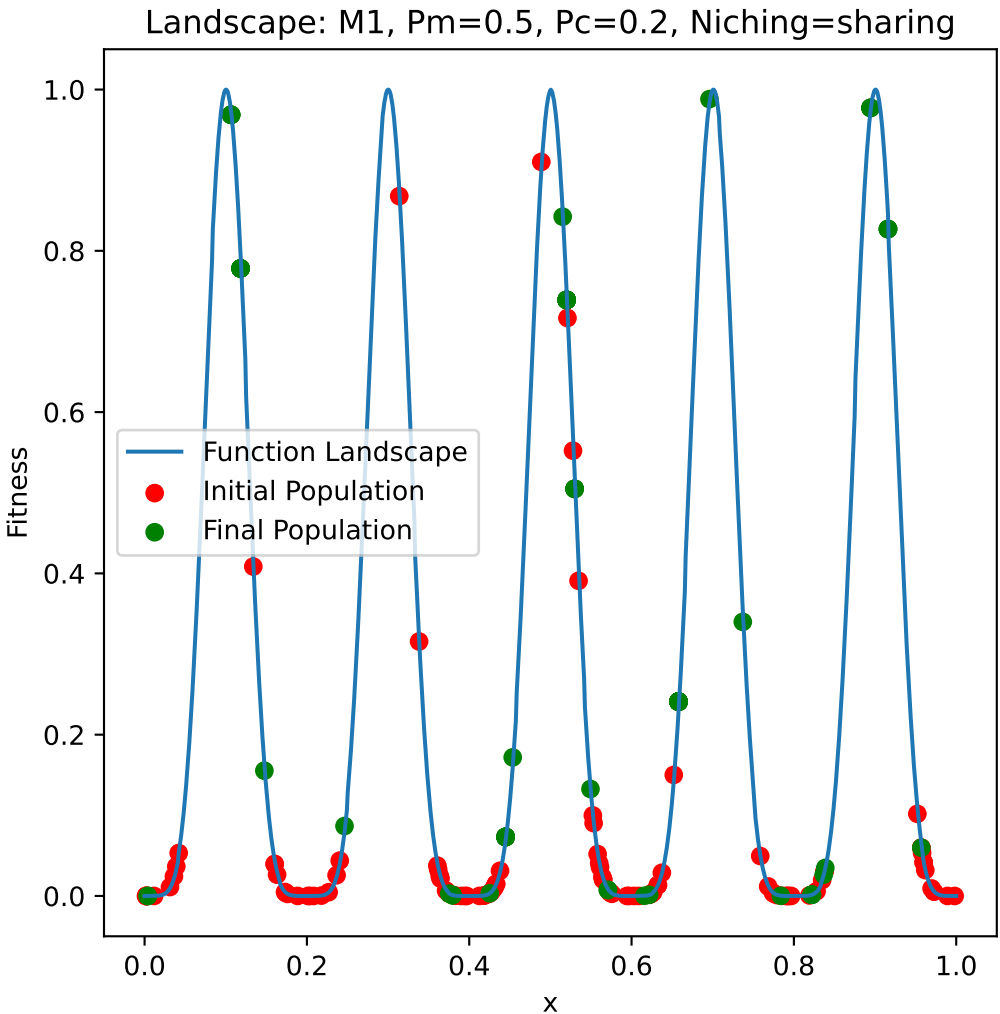

Fitness: M1, Pm=0.2, Pc=0.5, Niching=sharing
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

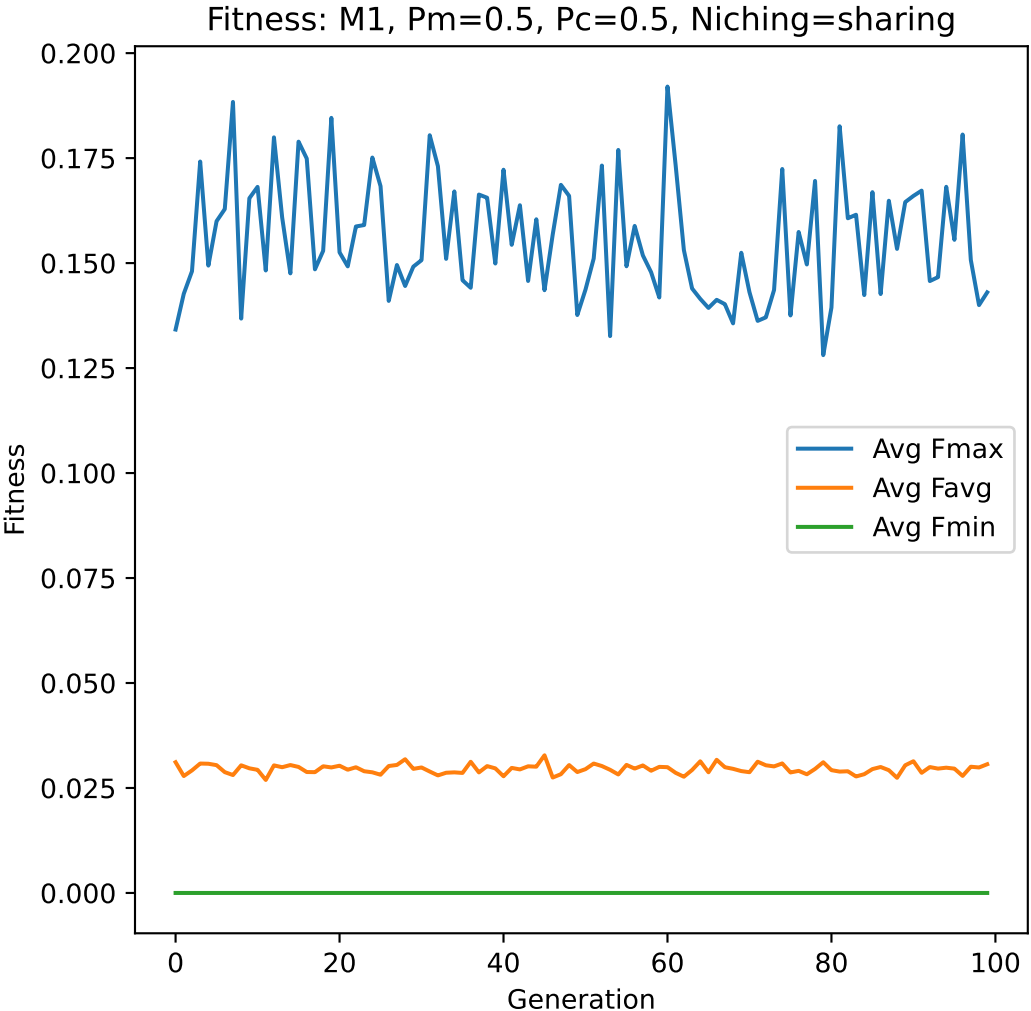

Landscape: M1, Pm=0.2, Pc=0.5, Niching=sharing
Fitness
x
Function Landscape
Initial Population
Final Population
0.0
0.2
0.4
0.6
0.8
1.0

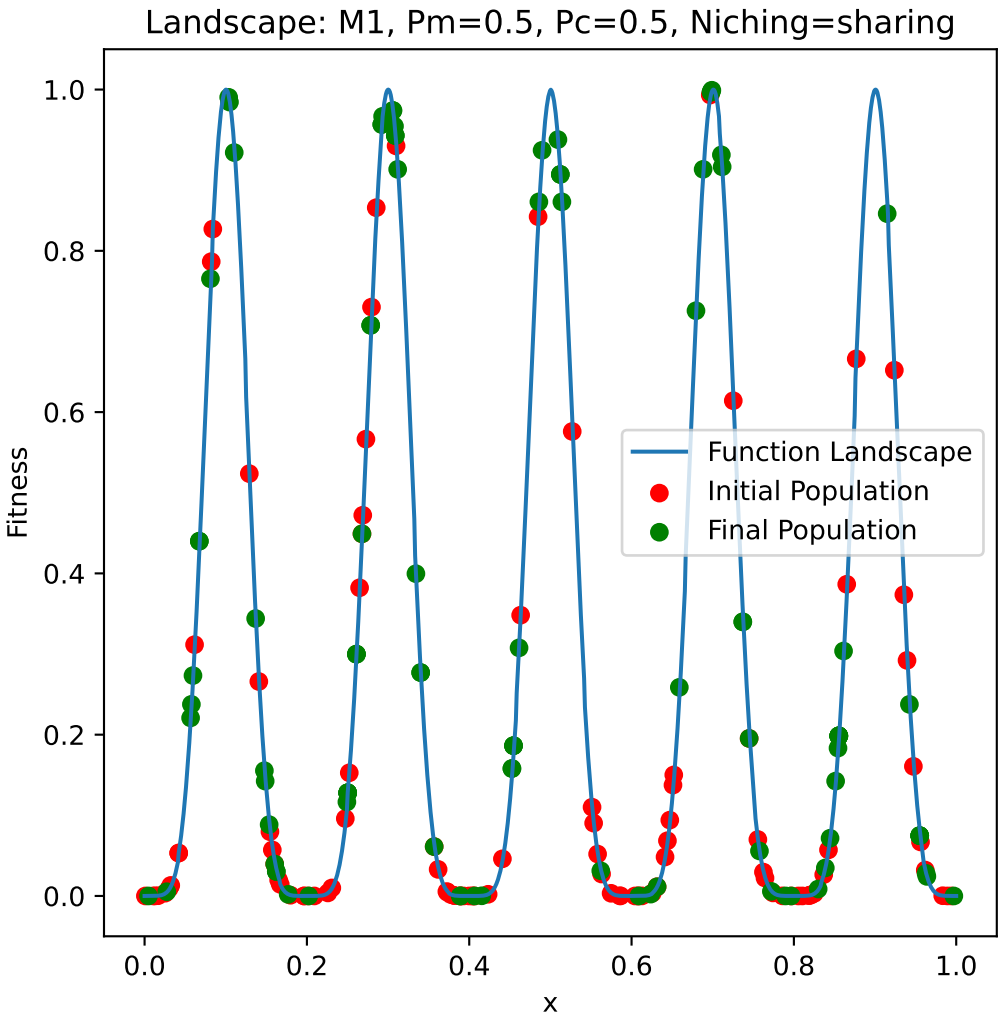

Fitness: M1, Pm=0.2, Pc=0.8, Niching=sharing
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
20
40
60
80
100
Generation

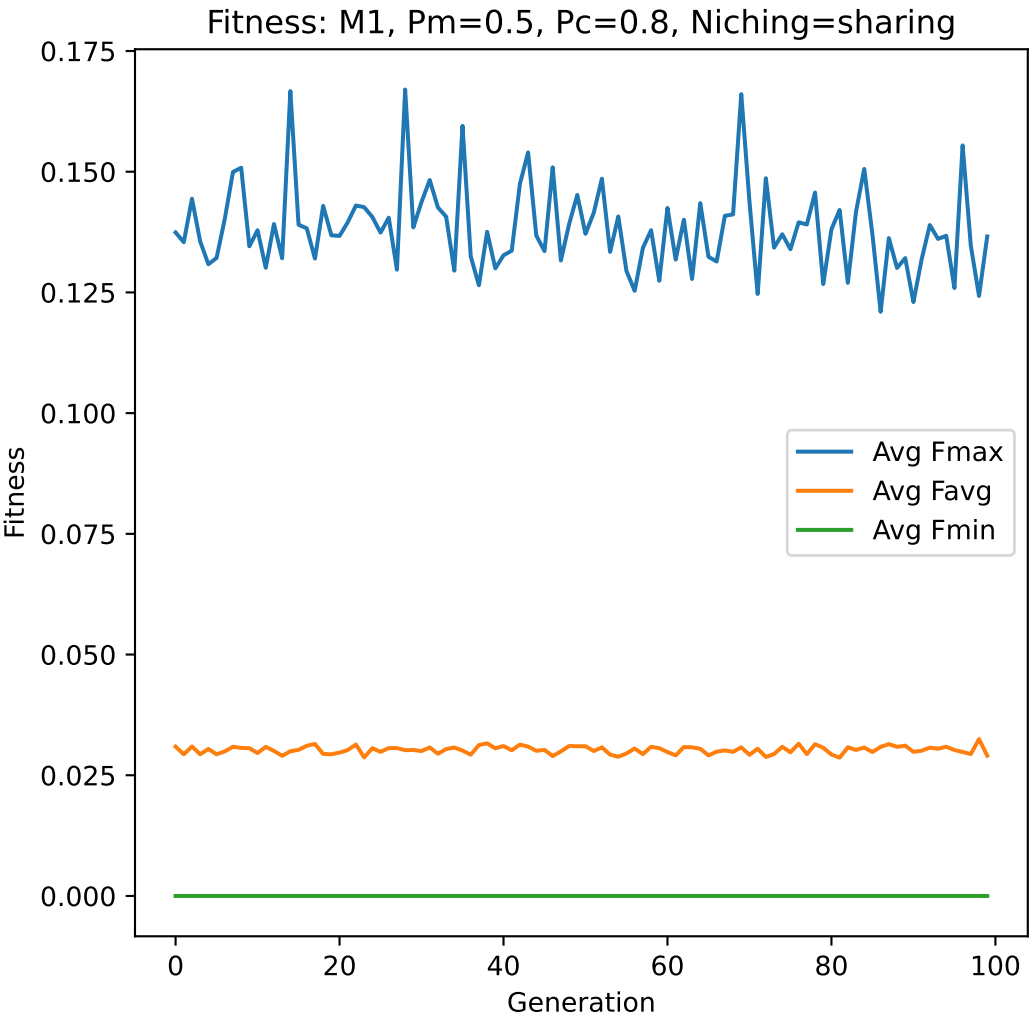

Landscape: M1, Pm=0.2, Pc=0.8, Niching=sharing
Fitness
x
Function Landscape
Initial Population
Final Population
0.0
0.2
0.4
0.6
0.8
1.0

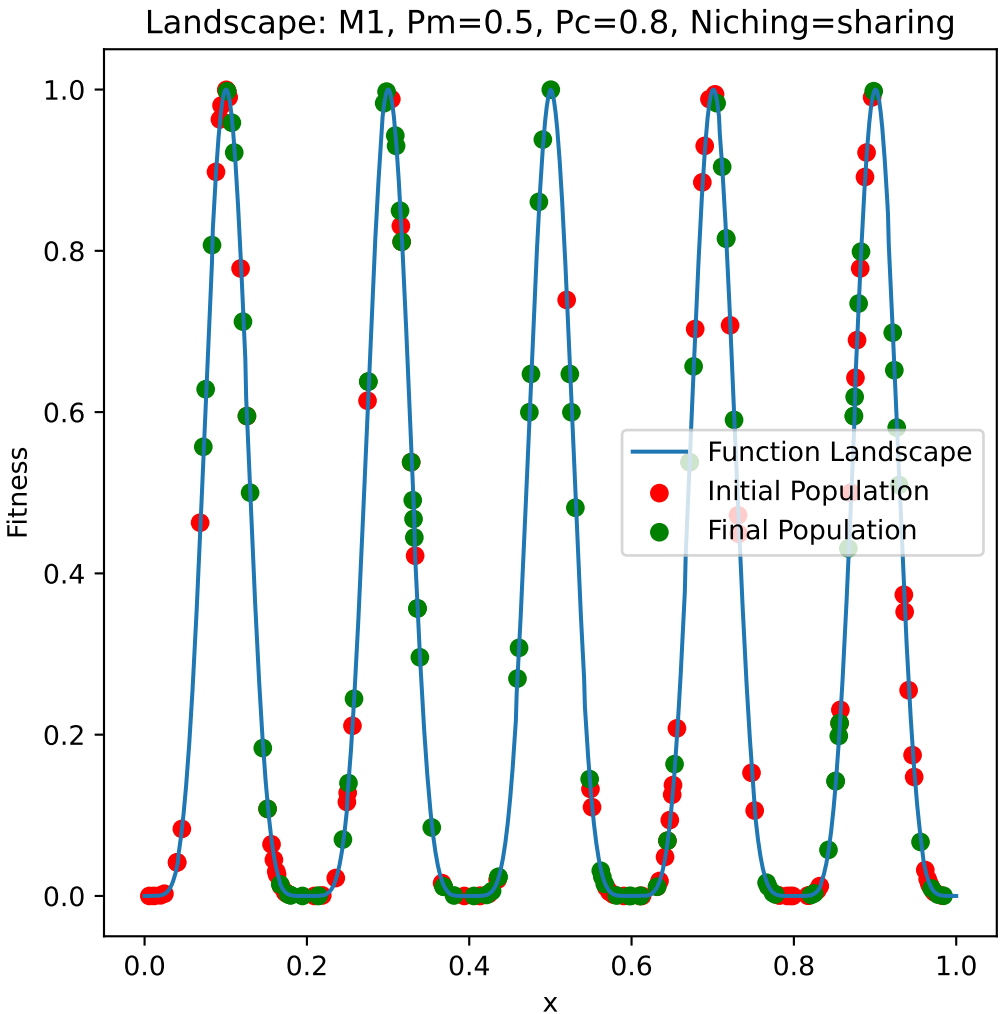

Fitness: M1, Pm=0.5, Pc=0.2, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
Fitness
0.0
0.1
0.2
0.3
0.4
0
20
40
60
80
100
Generation

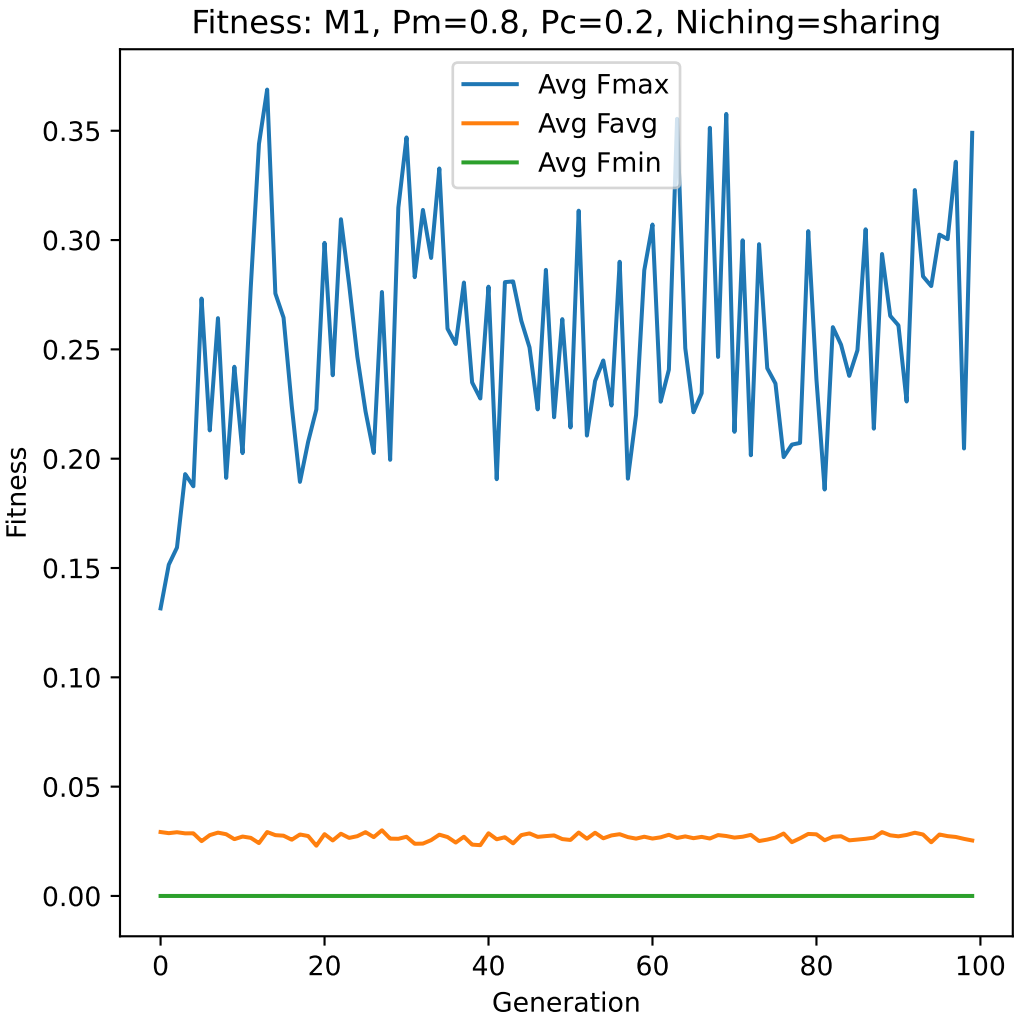

Landscape: M1, Pm=0.5, Pc=0.2, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

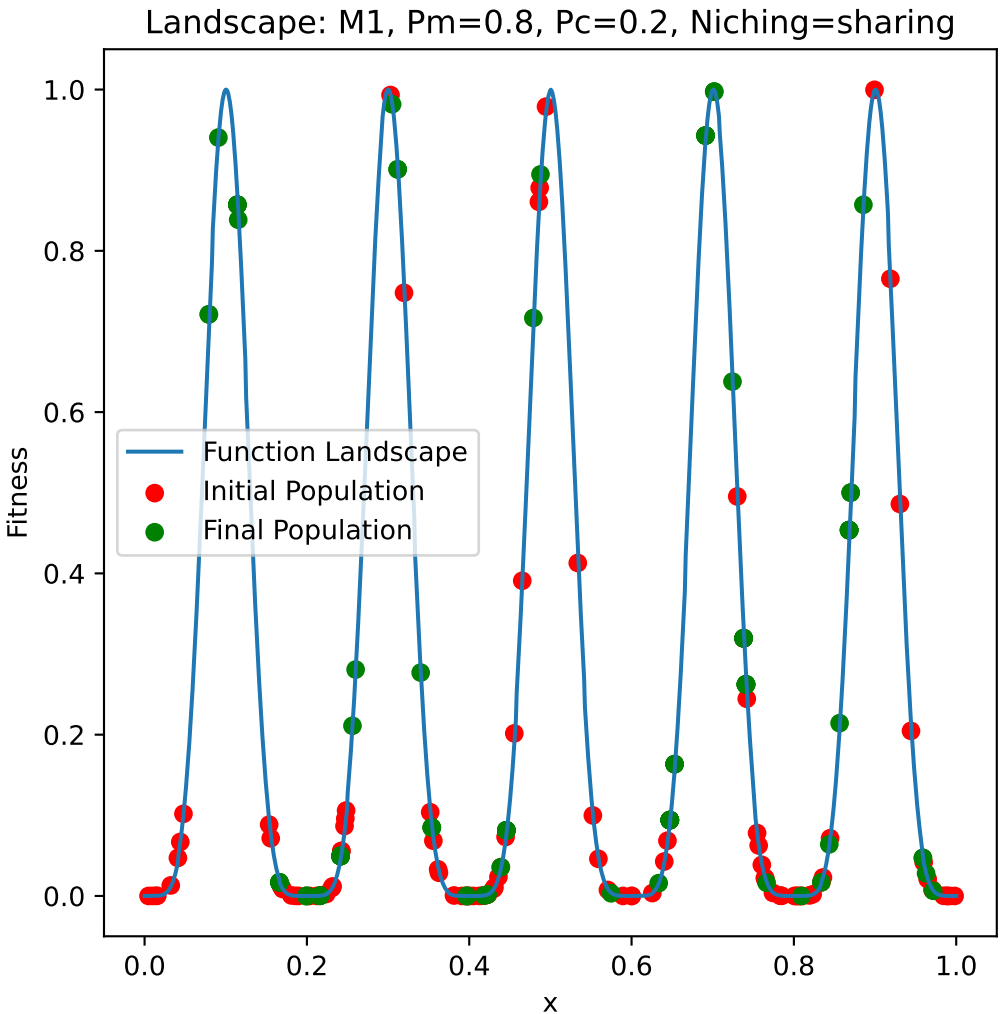

Fitness: M1, Pm=0.5, Pc=0.5, Niching=sharing
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
20
40
60
80
100
Generation

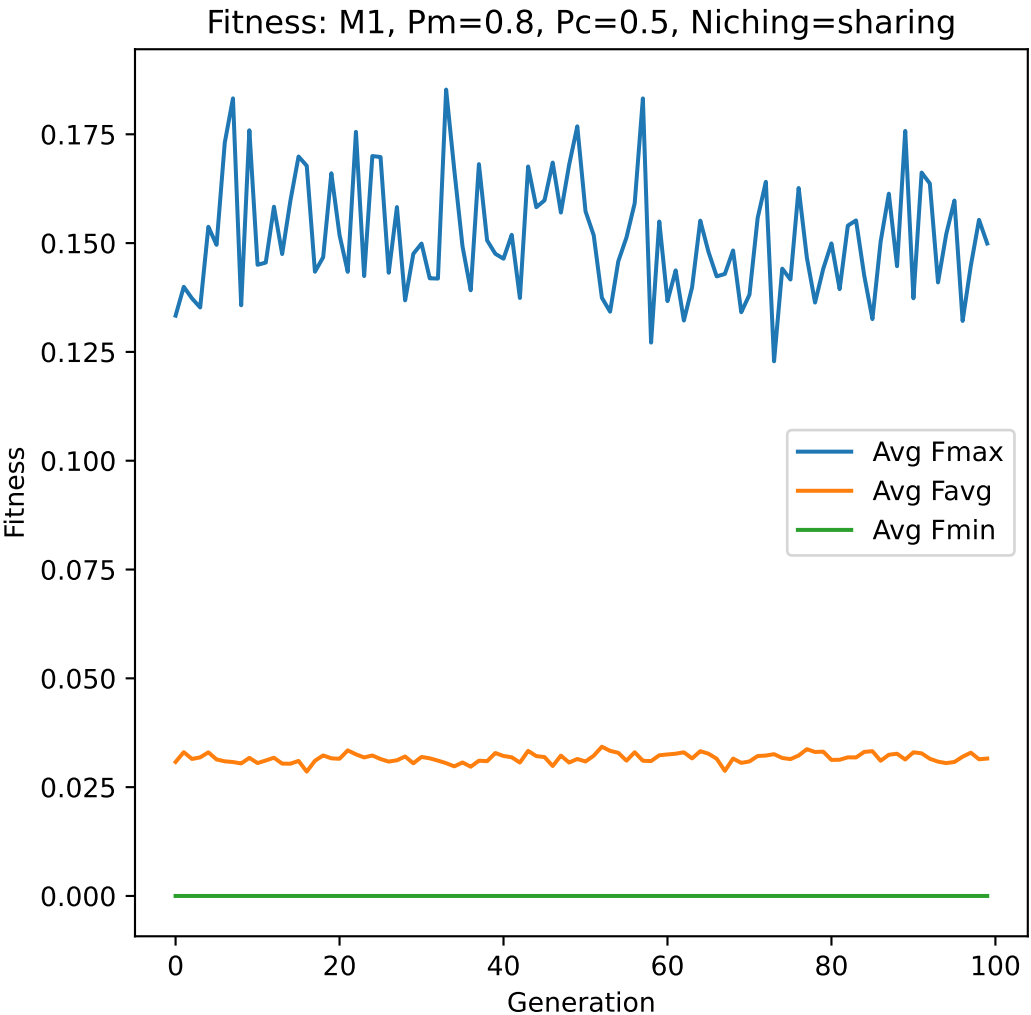

Landscape: M1, Pm=0.5, Pc=0.5, Niching=sharing
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

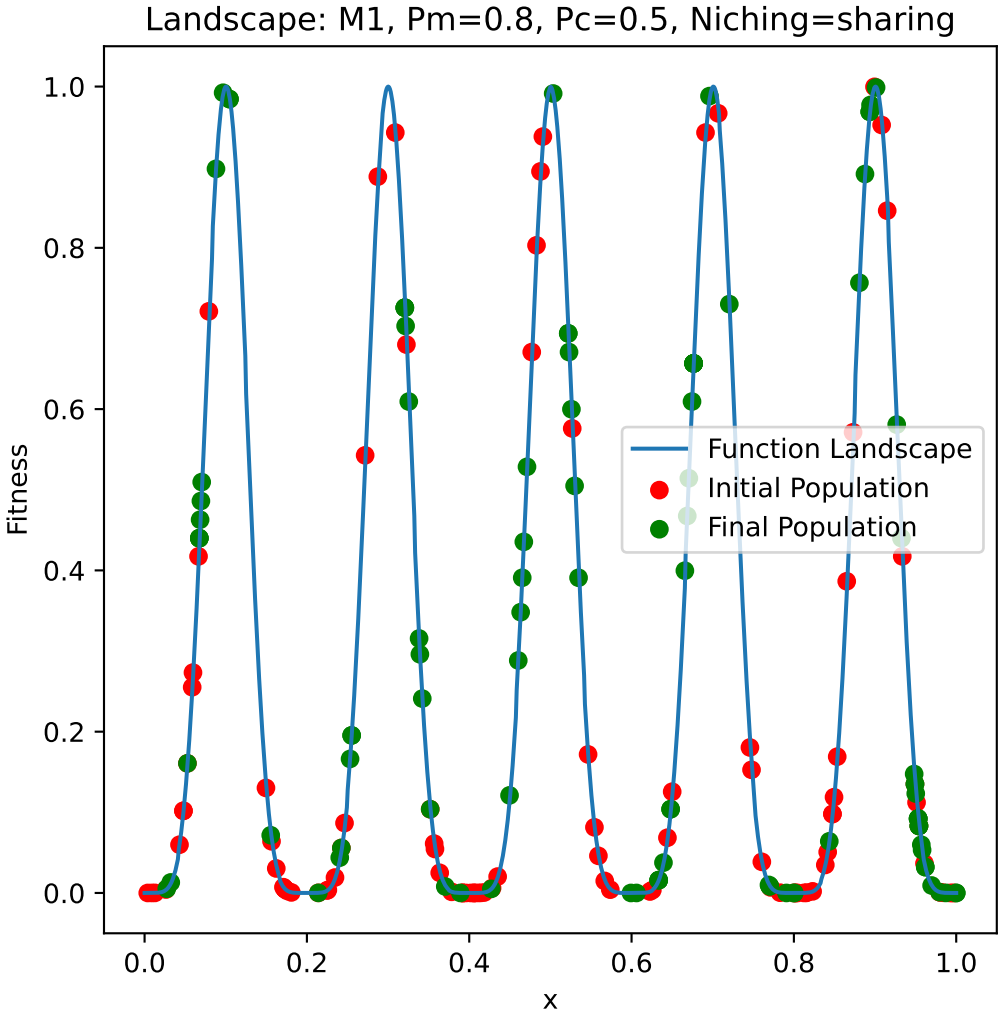

Fitness: M1, Pm=0.5, Pc=0.8, Niching=sharing
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

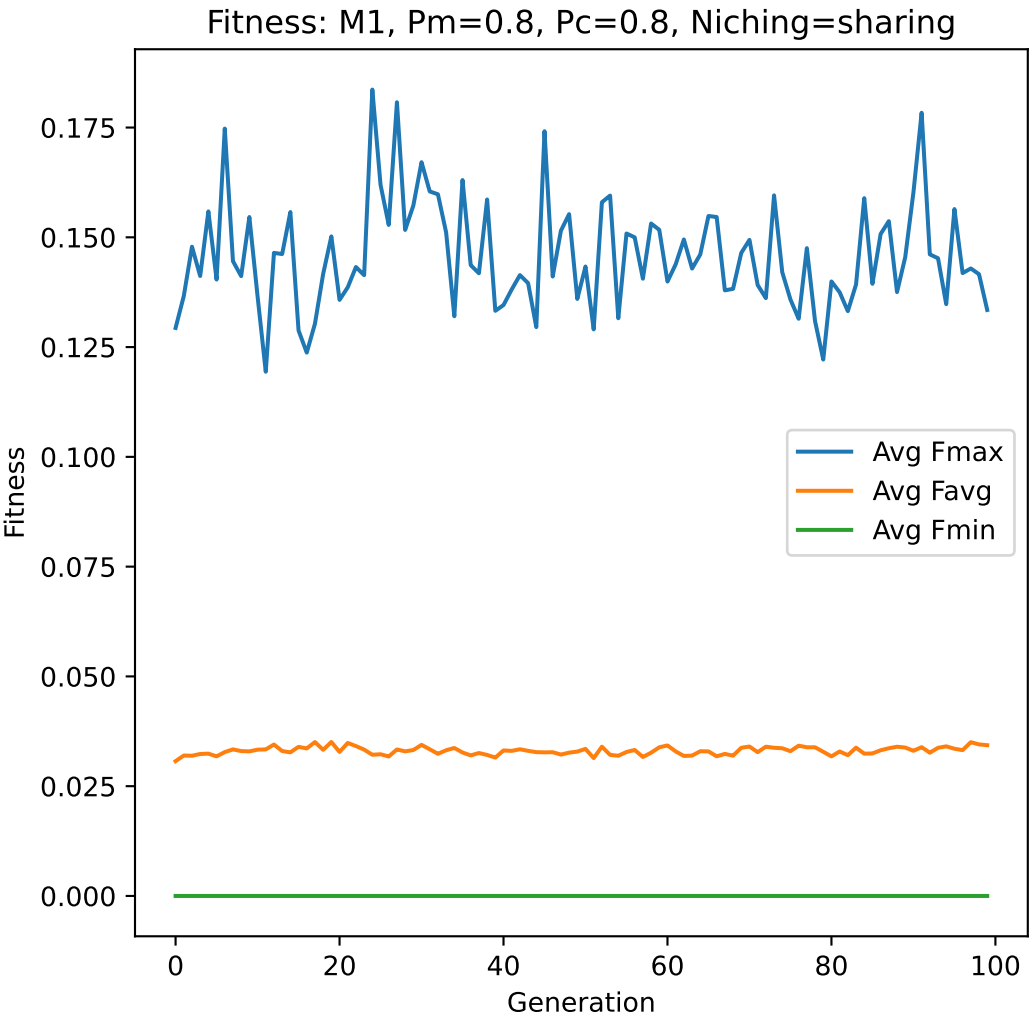

Landscape: M1, Pm=0.5, Pc=0.8, Niching=sharing
Fitness
x
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

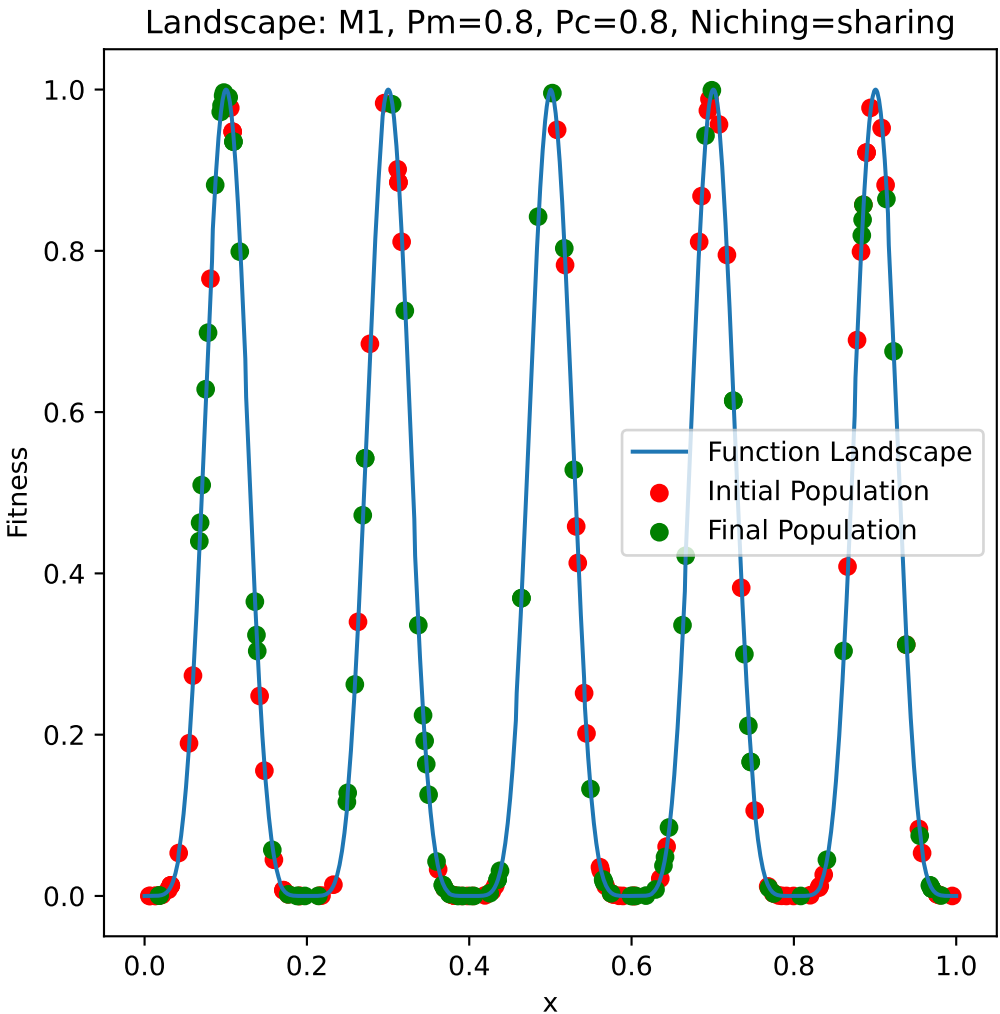

Fitness: M1, Pm=0.8, Pc=0.2, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
Fitness
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
Generation

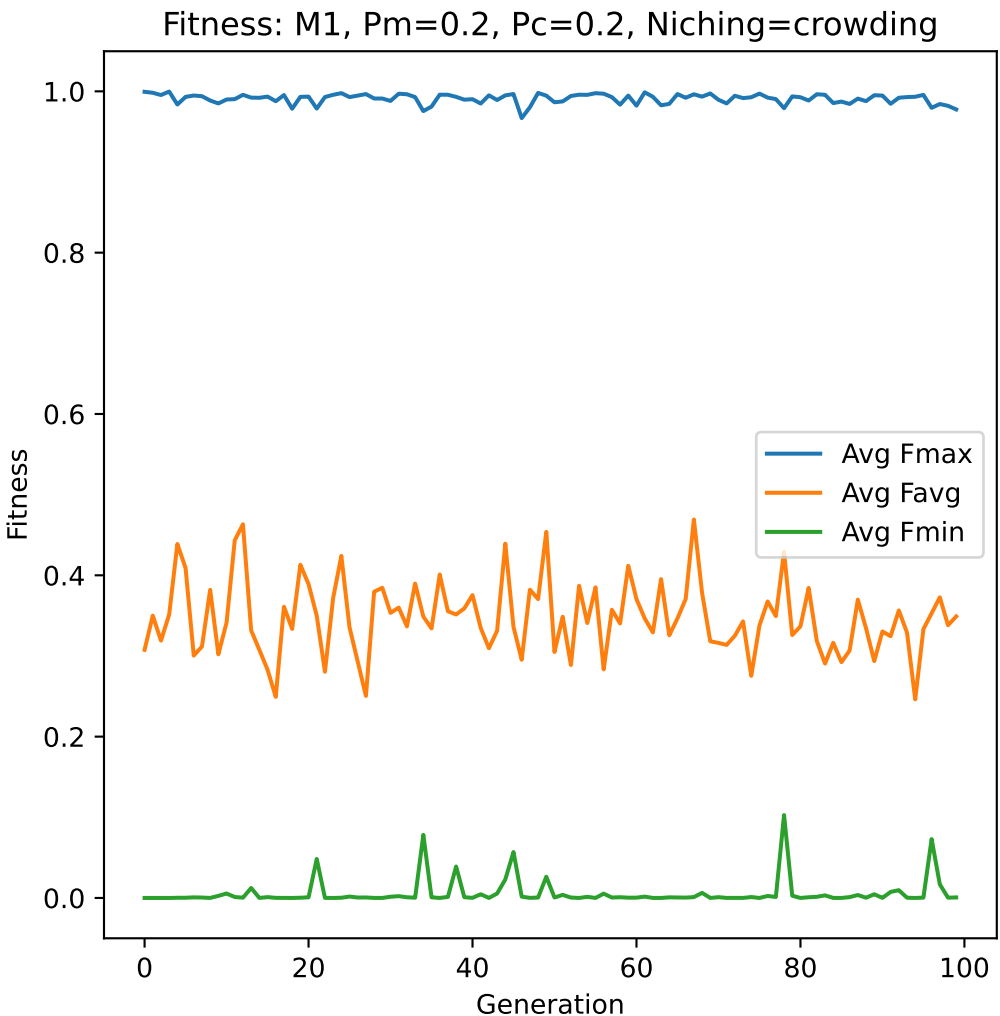

Landscape: M1, Pm=0.8, Pc=0.2, Niching=sharing
Fitness
x
Function Landscape
Initial Population
Final Population
0.0
0.2
0.4
0.6
0.8
1.0

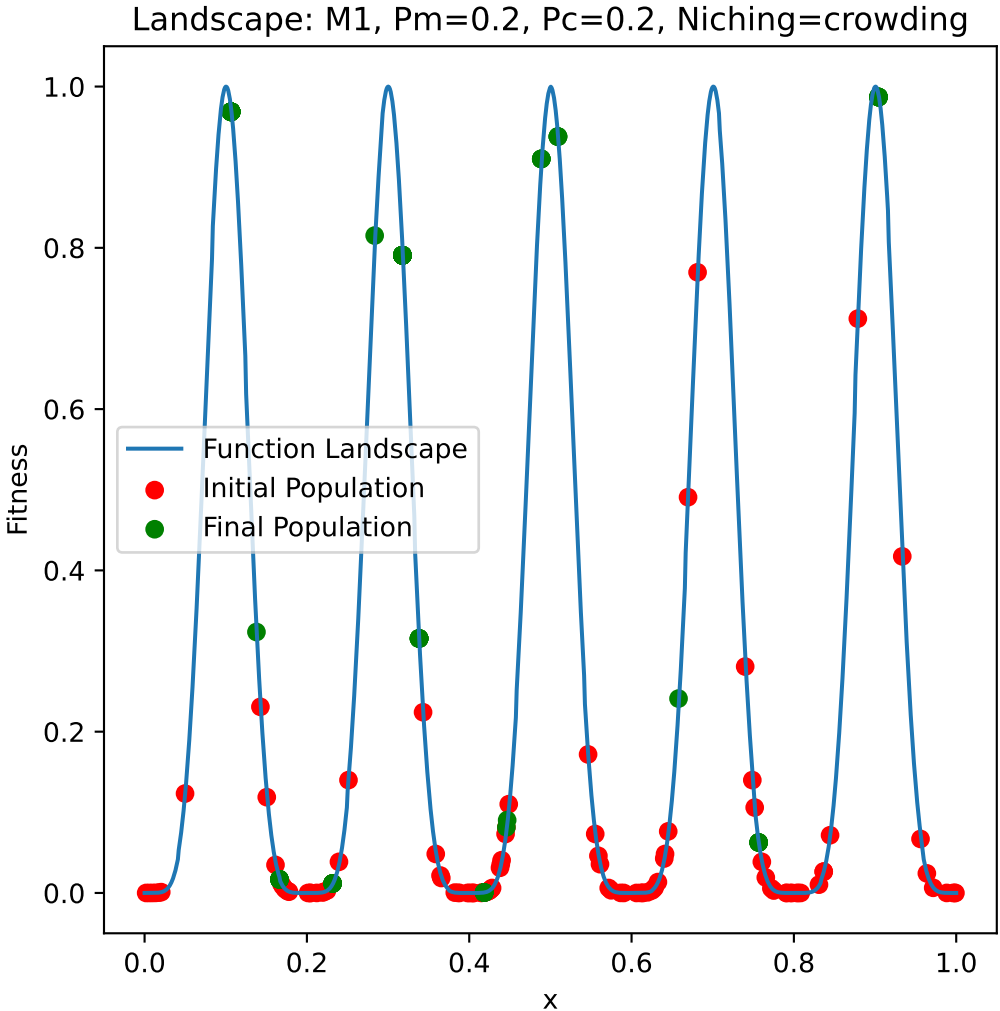

Fitness: M1, Pm=0.8, Pc=0.5, Niching=sharing
Fitness
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

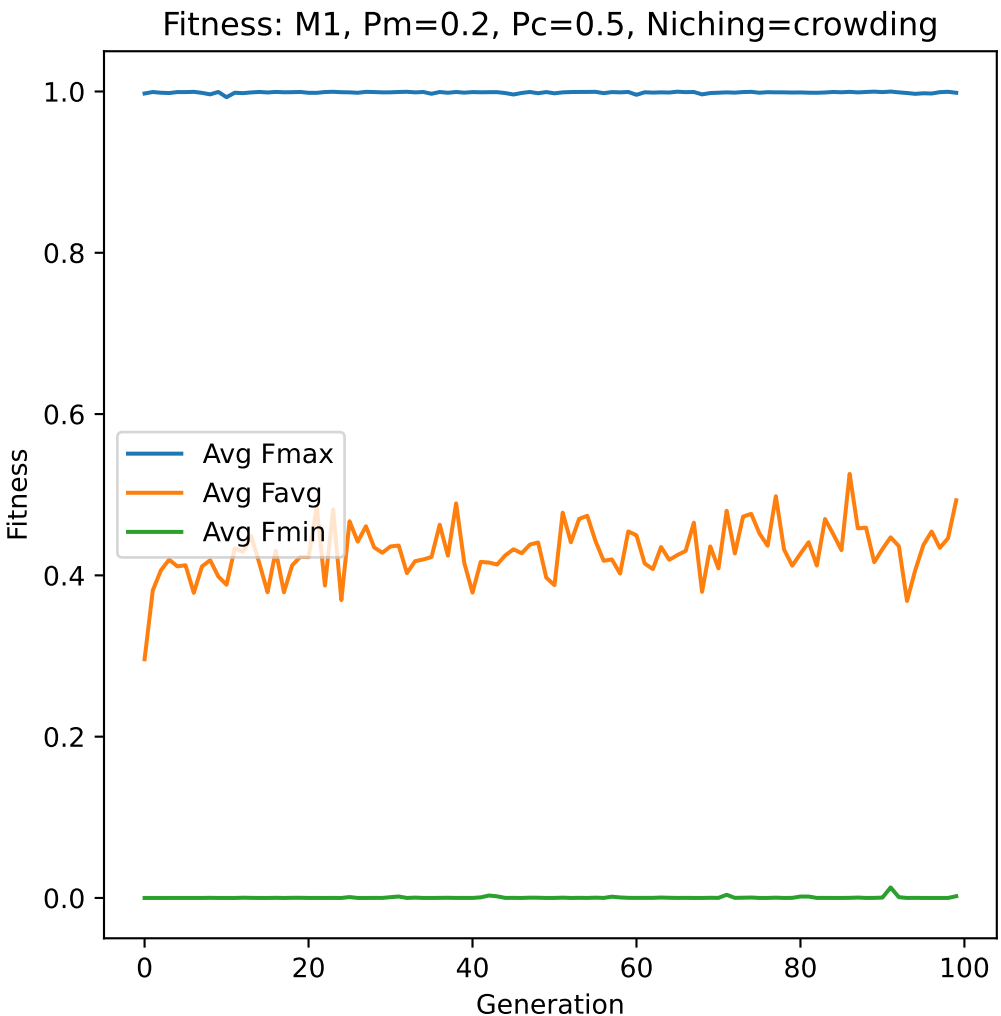

Landscape: M1, Pm=0.8, Pc=0.5, Niching=sharing
Fitness
x
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

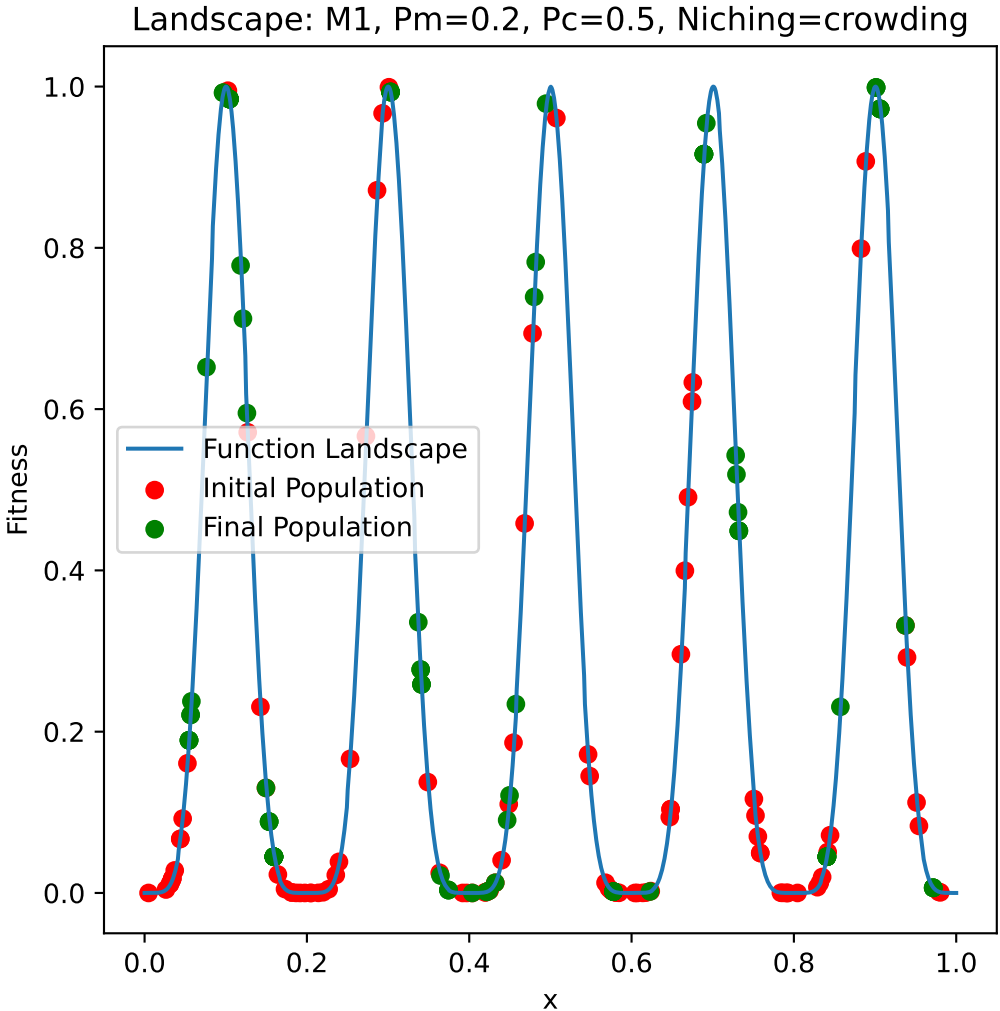

Fitness: M1, Pm=0.8, Pc=0.8, Niching=sharing
Fitness
Generation
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
0
20
40
60
80
100
Avg Fmax
Avg Favg
Avg Fmin

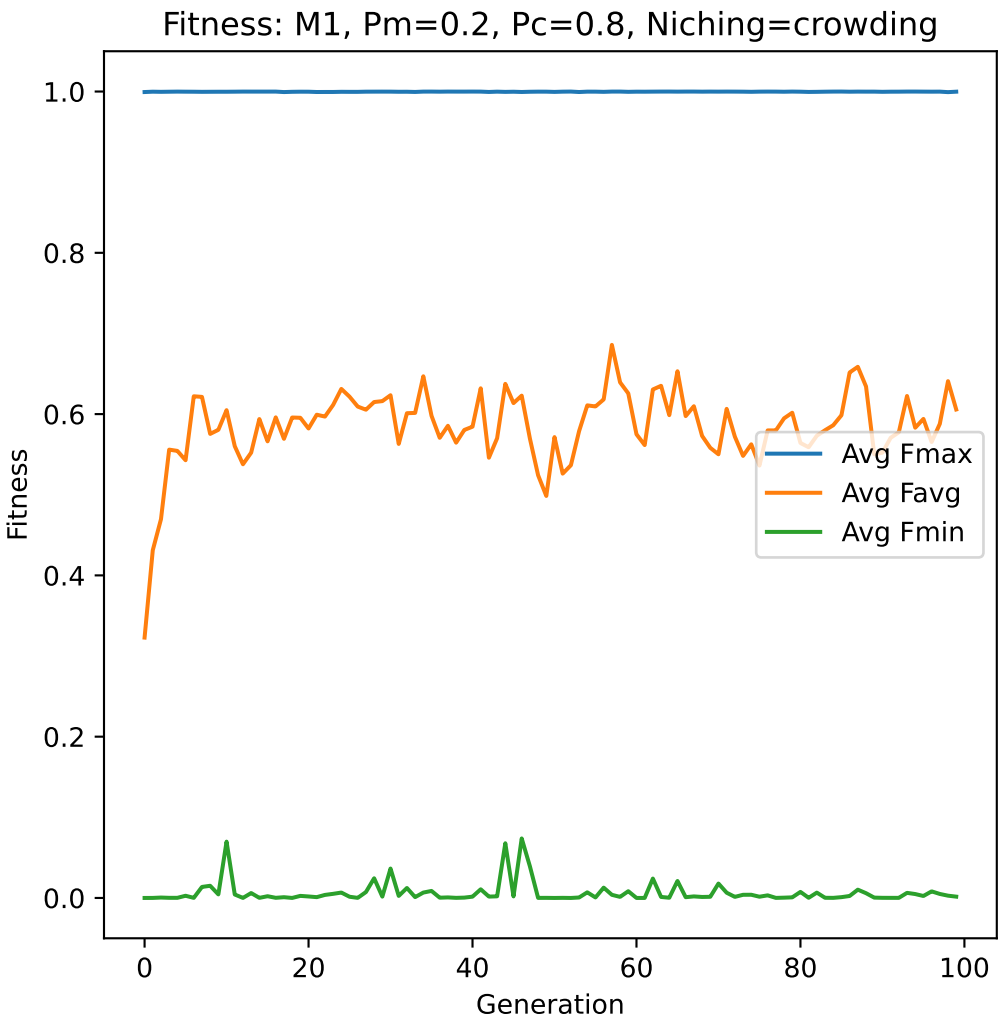

Landscape: M1, Pm=0.8, Pc=0.8, Niching=sharing
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

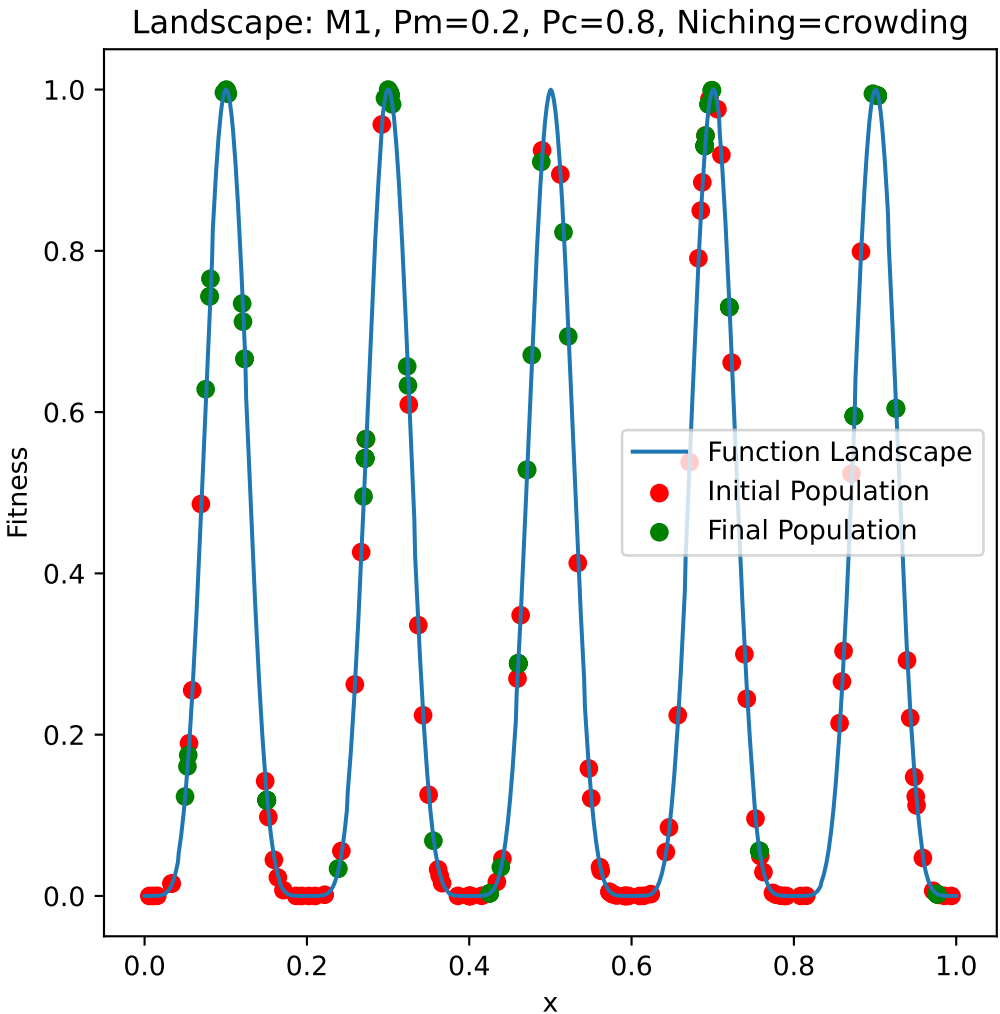

Fitness: M1, Pm=0.2, Pc=0.2, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

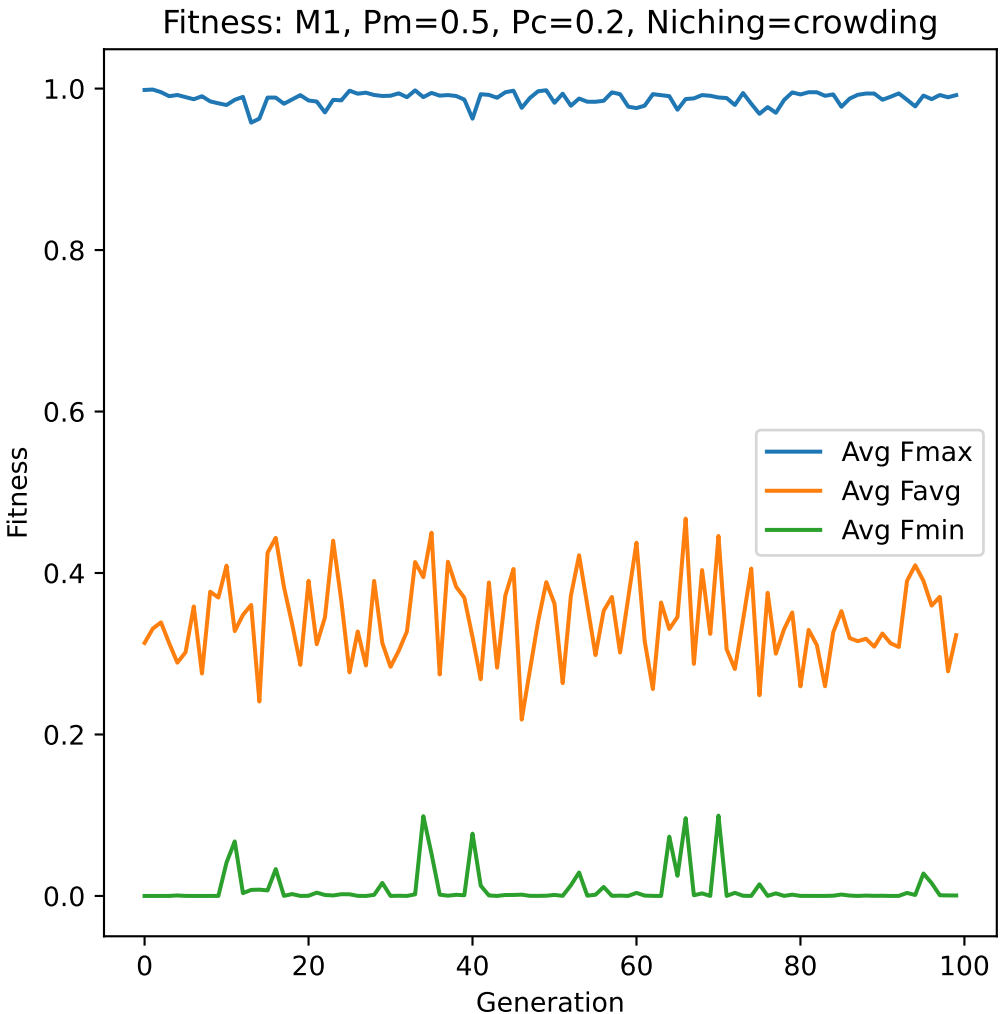

Landscape: M1, Pm=0.2, Pc=0.2, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

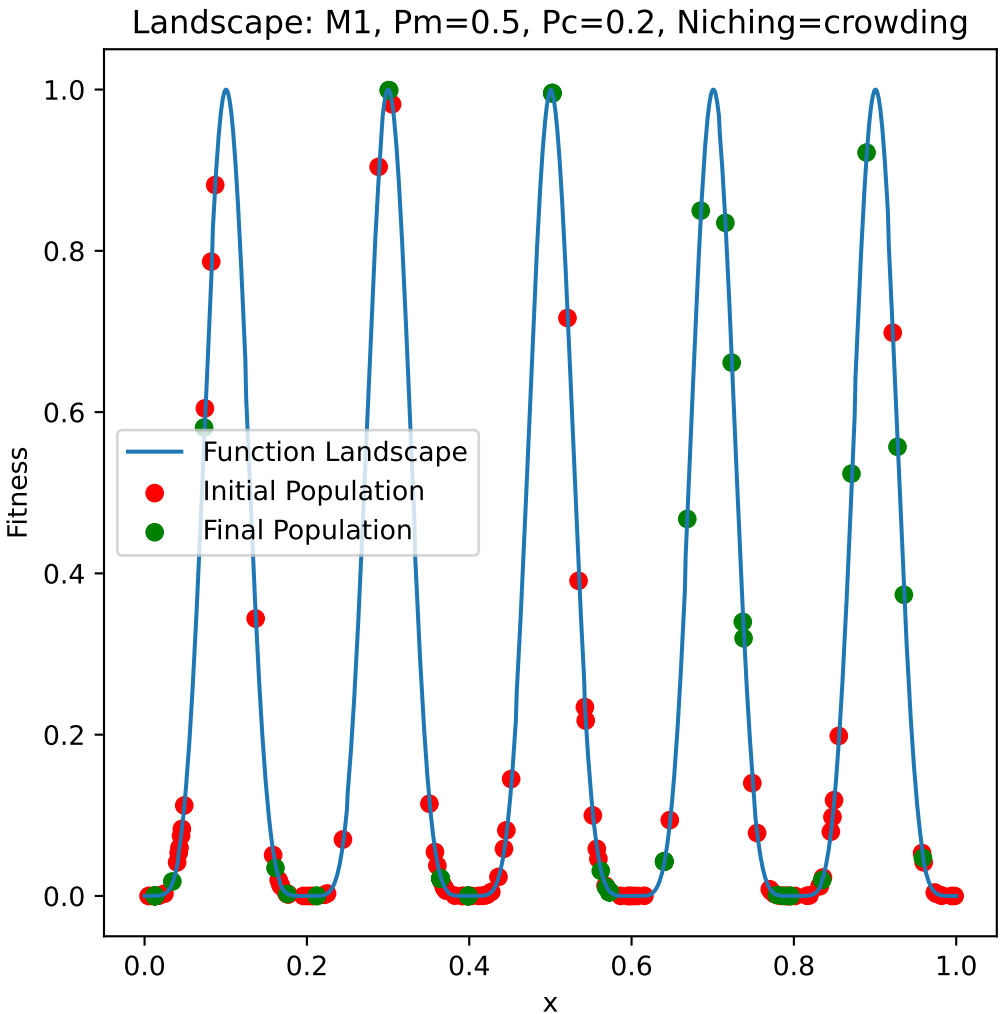

Fitness: M1, Pm=0.2, Pc=0.5, Niching=crowding
Avg Fmax
Avg Favg
Avg Fmin
Fitness
Generation
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100

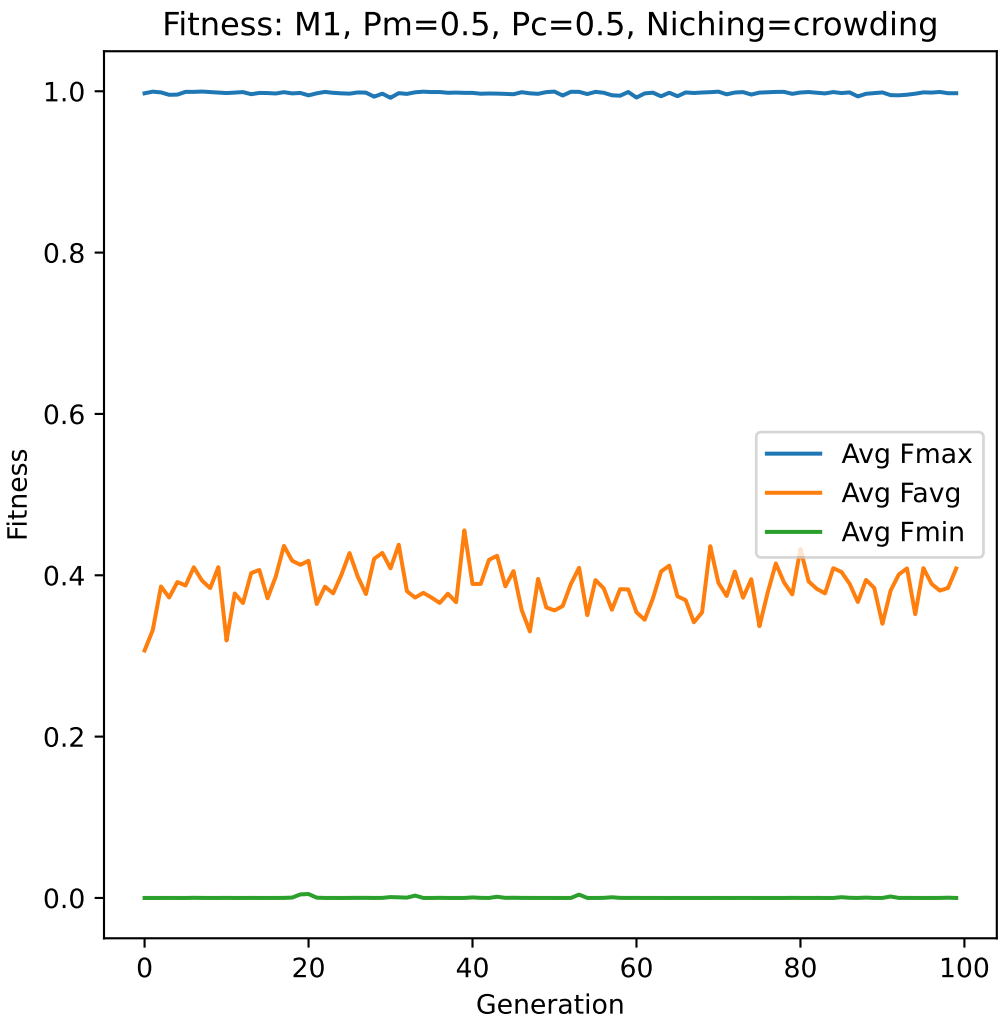

Landscape: M1, Pm=0.2, Pc=0.5, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

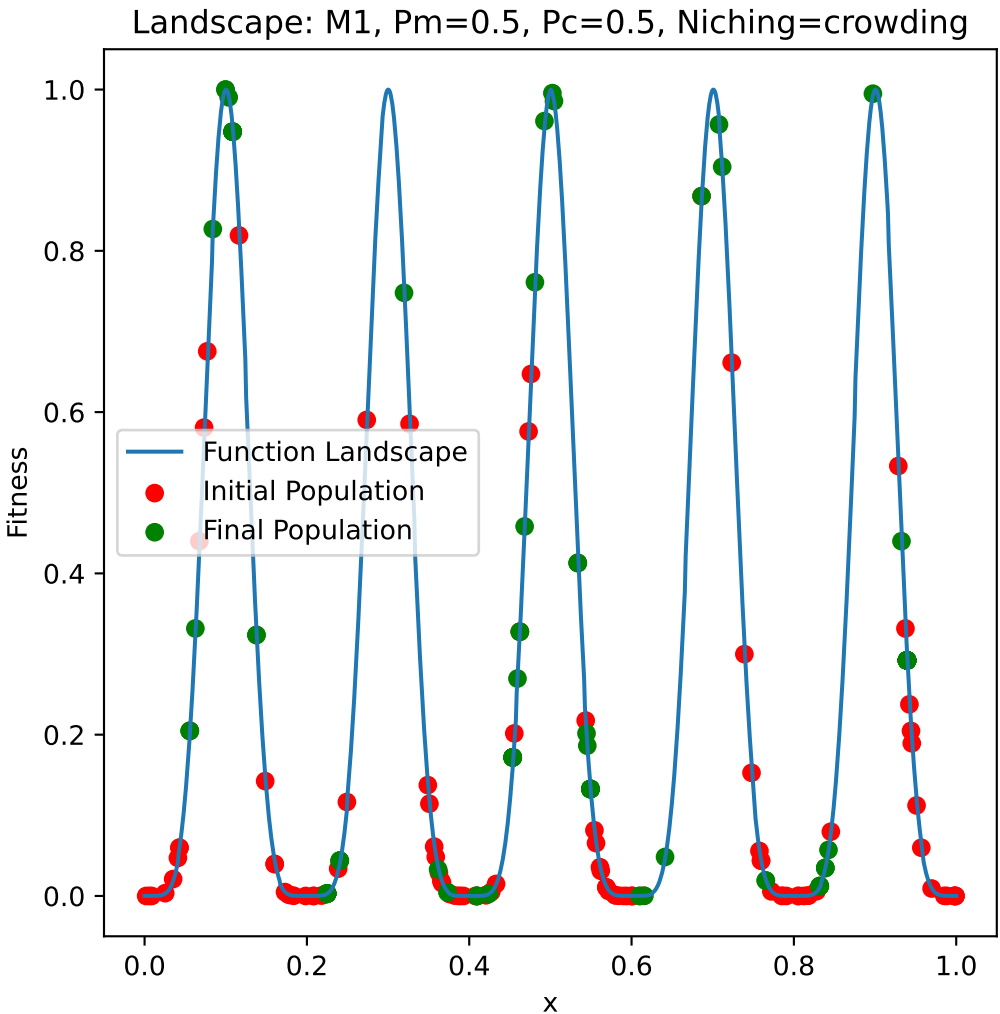

Fitness: M1, Pm=0.2, Pc=0.8, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

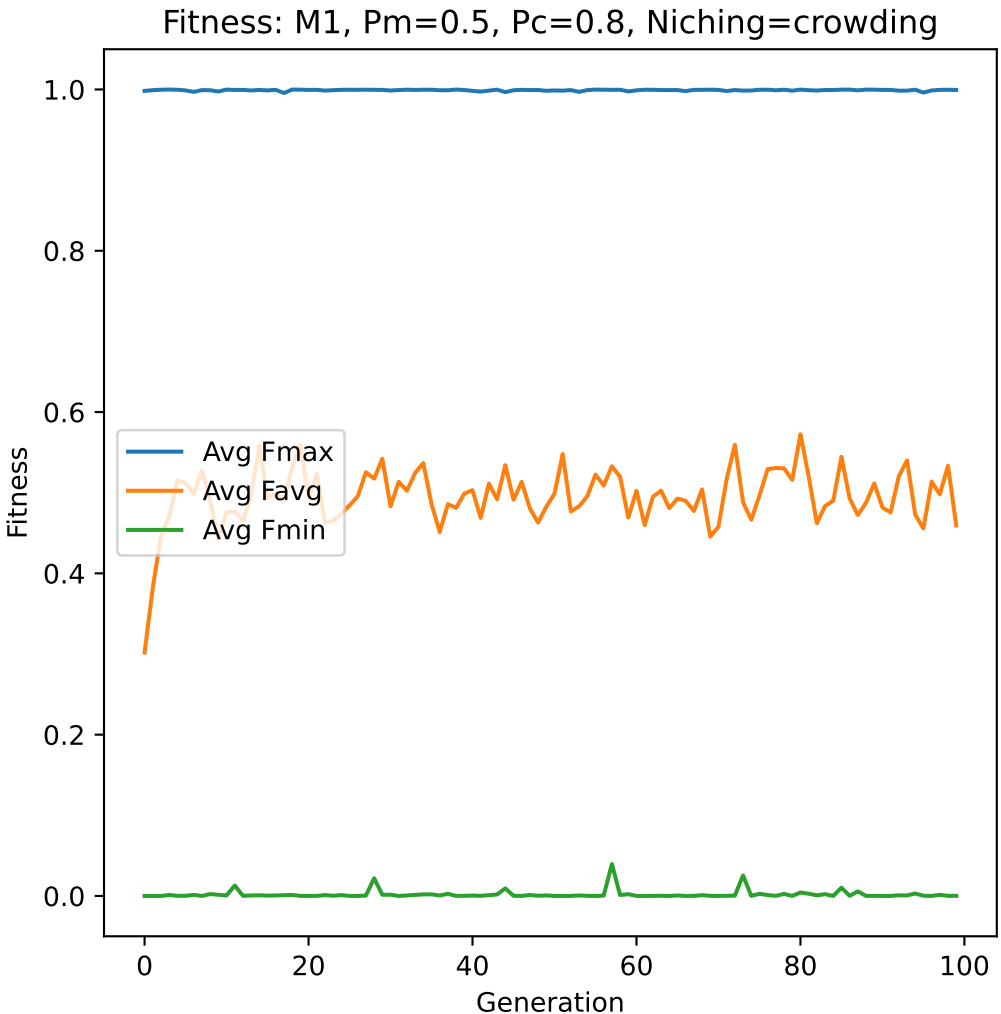

Landscape: M1, Pm=0.2, Pc=0.8, Niching=crowding
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

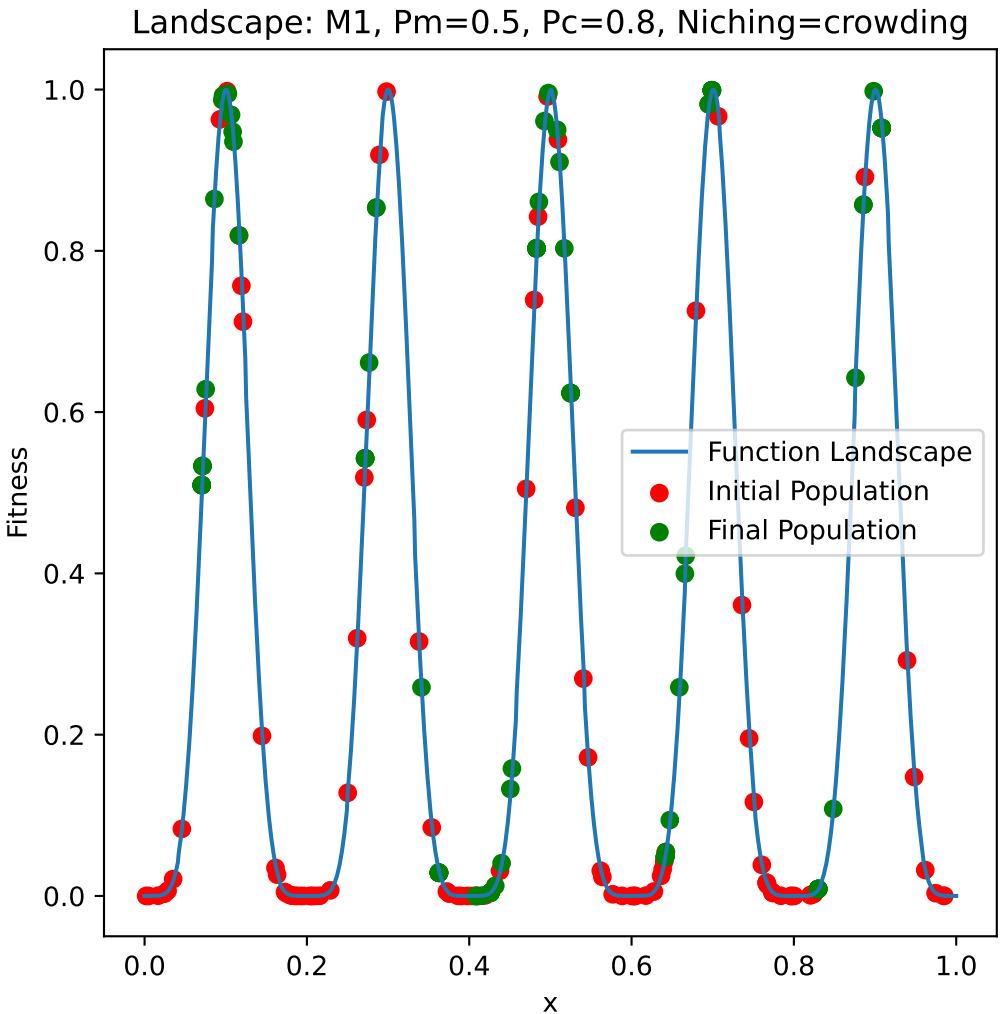

Fitness: M1, Pm=0.5, Pc=0.2, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

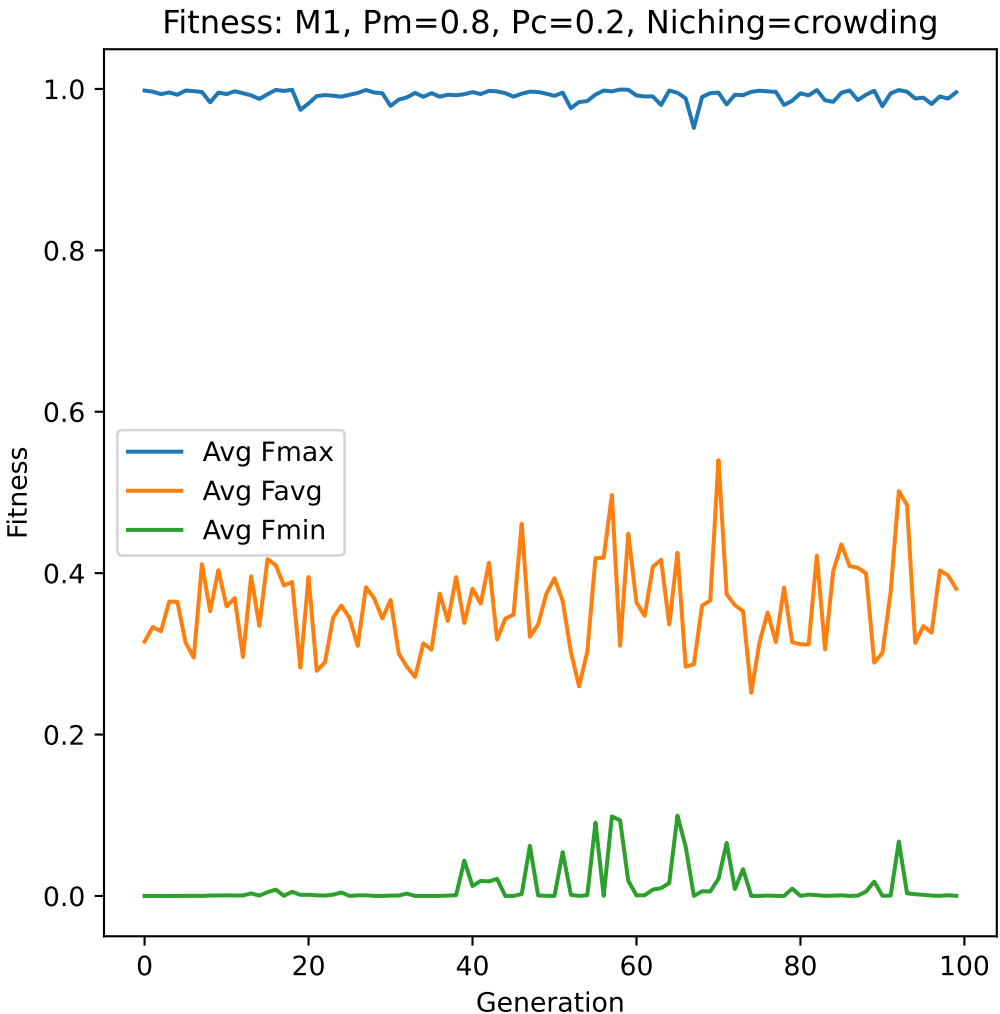

Landscape: M1, Pm=0.5, Pc=0.2, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

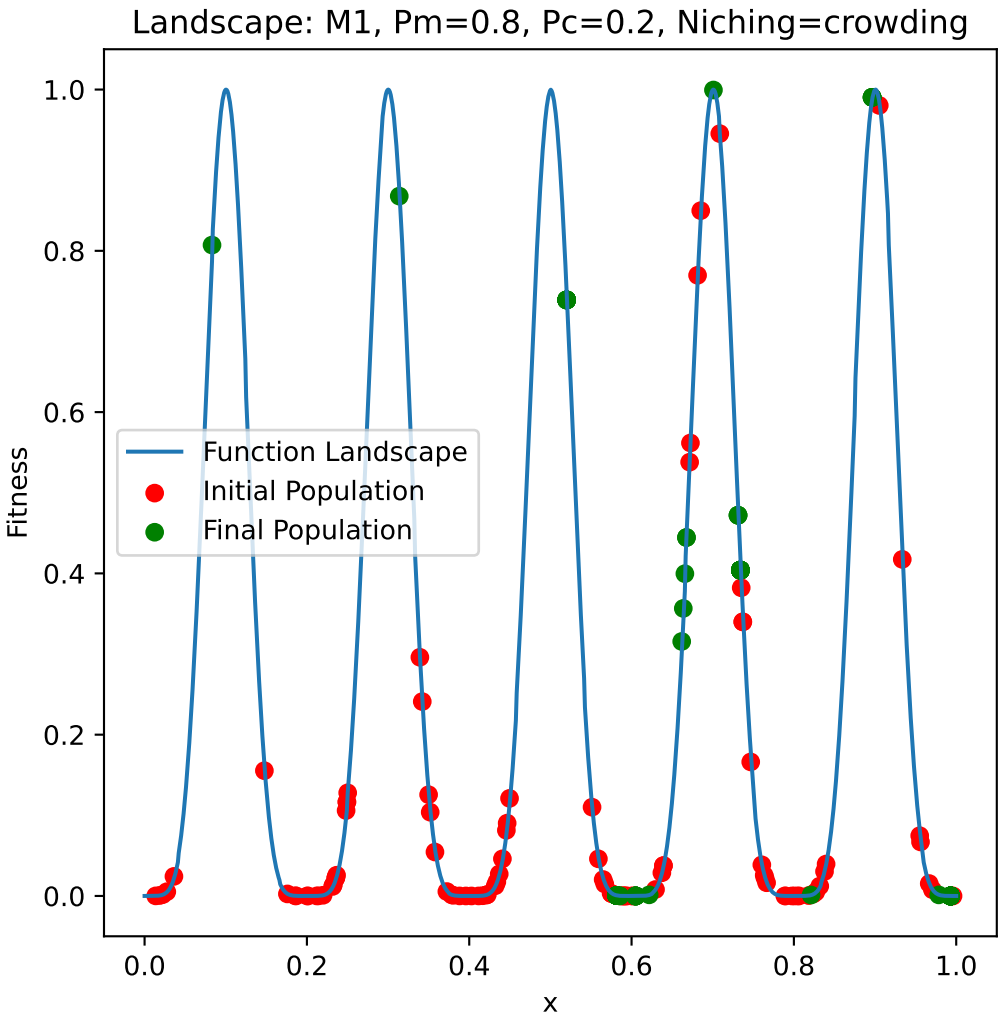

Fitness: M1, Pm=0.5, Pc=0.5, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

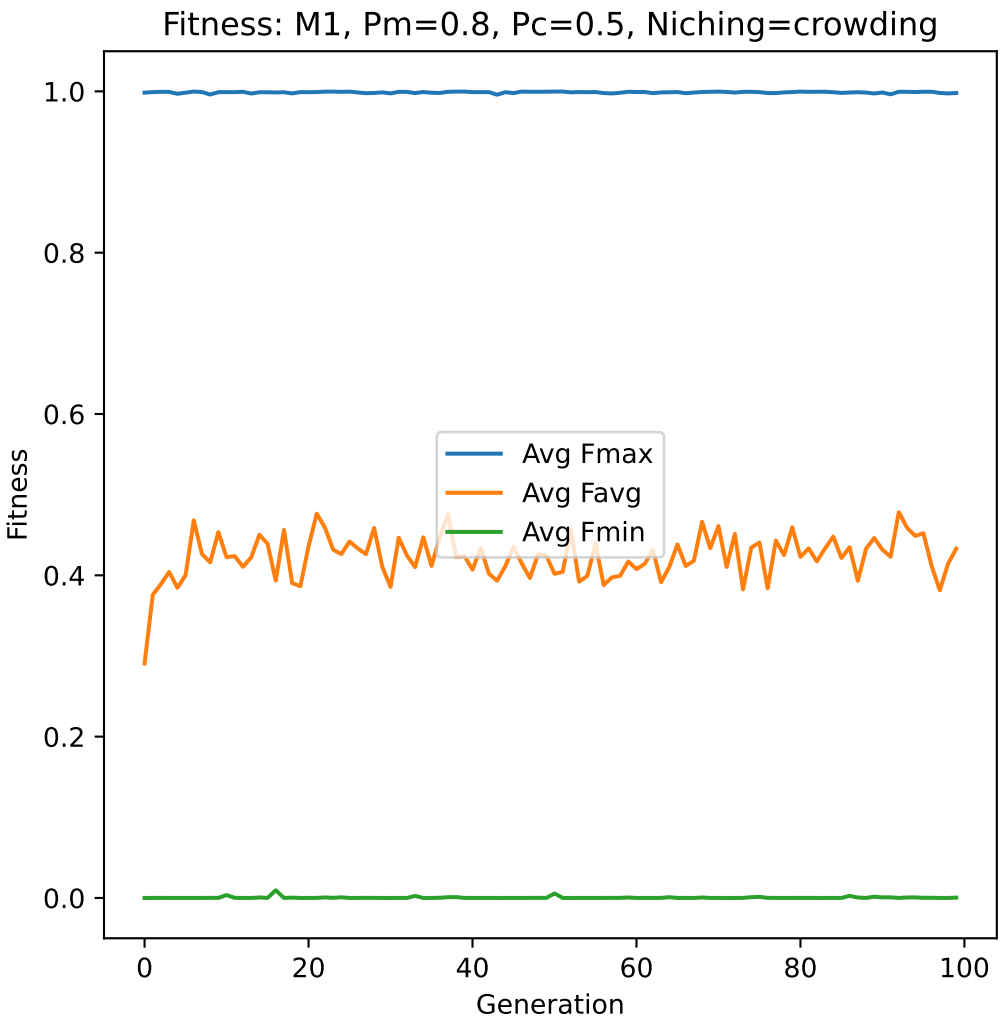

Landscape: M1, Pm=0.5, Pc=0.5, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

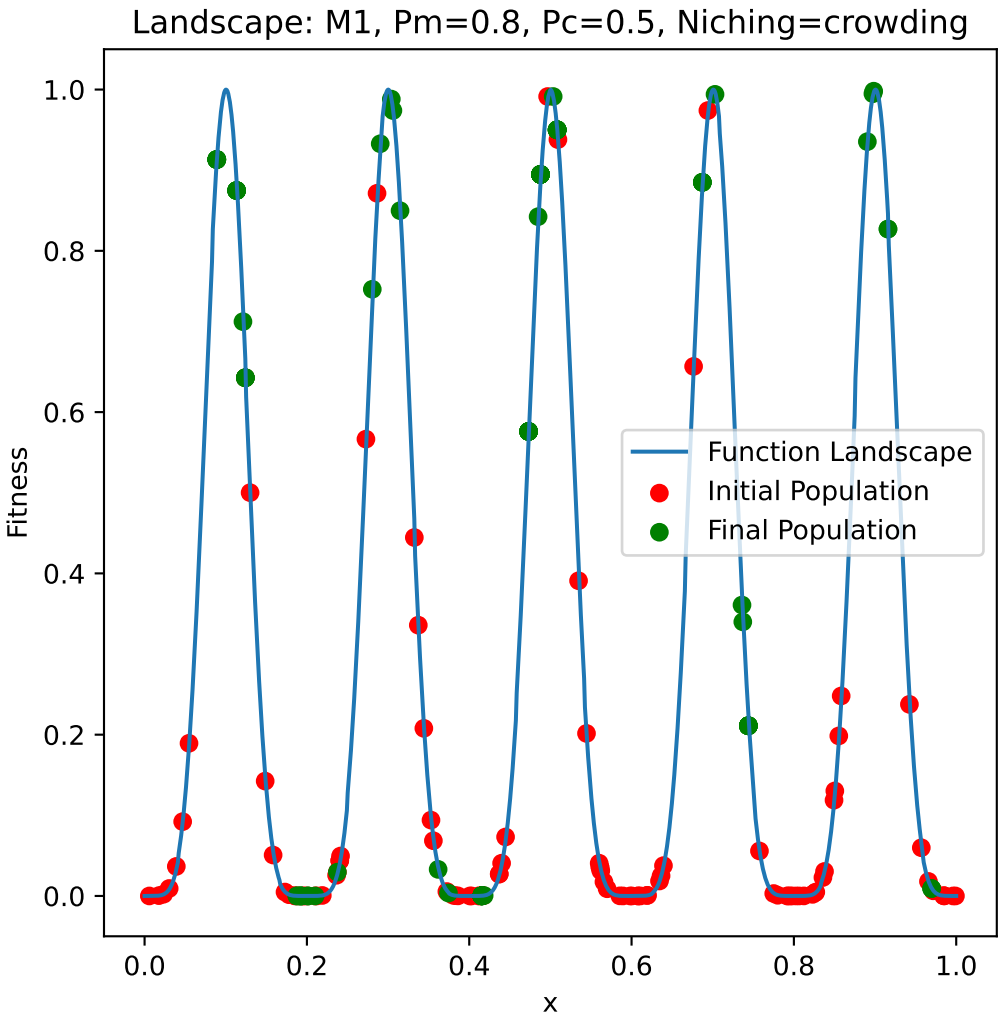

Fitness: M1, Pm=0.5, Pc=0.8, Niching=crowding
Avg Fmax
Avg Favg
Avg Fmin
Fitness
Generation
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100

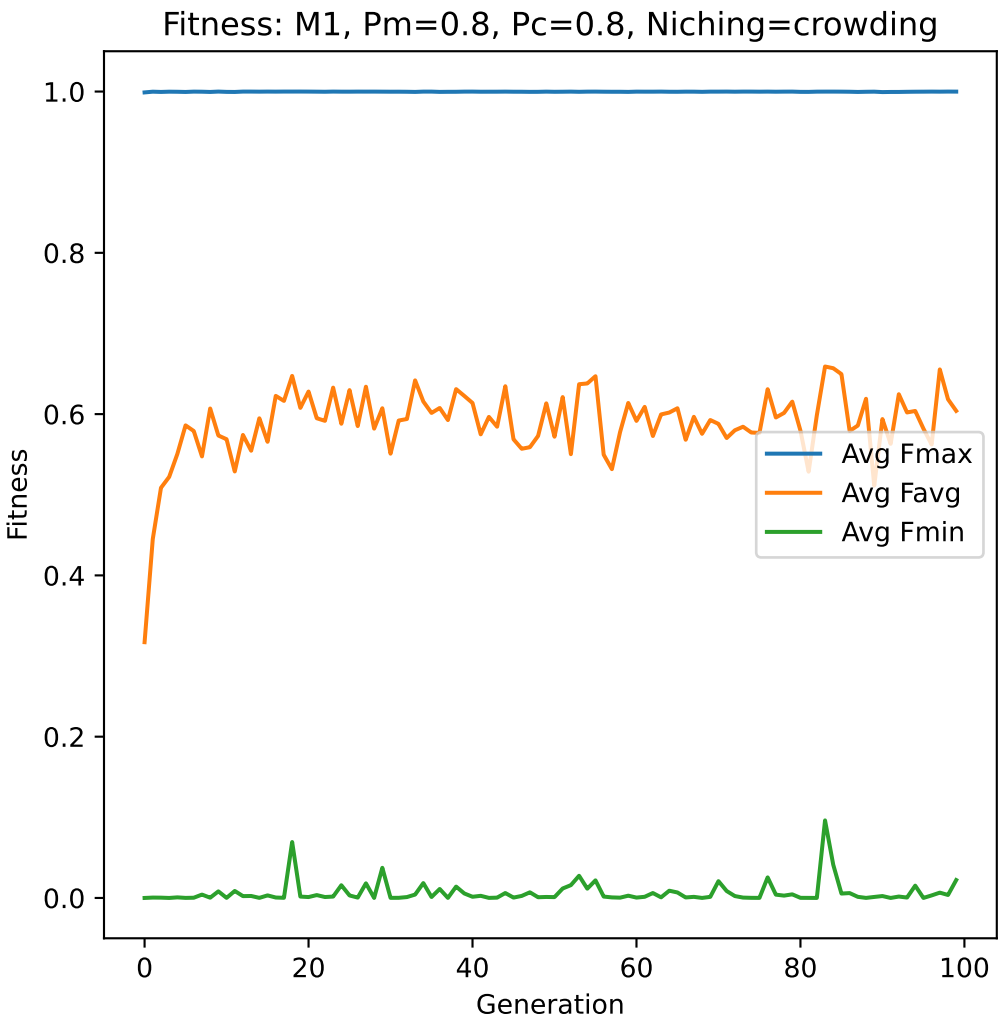

Landscape: M1, Pm=0.5, Pc=0.8, Niching=crowding
Fitness
x
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

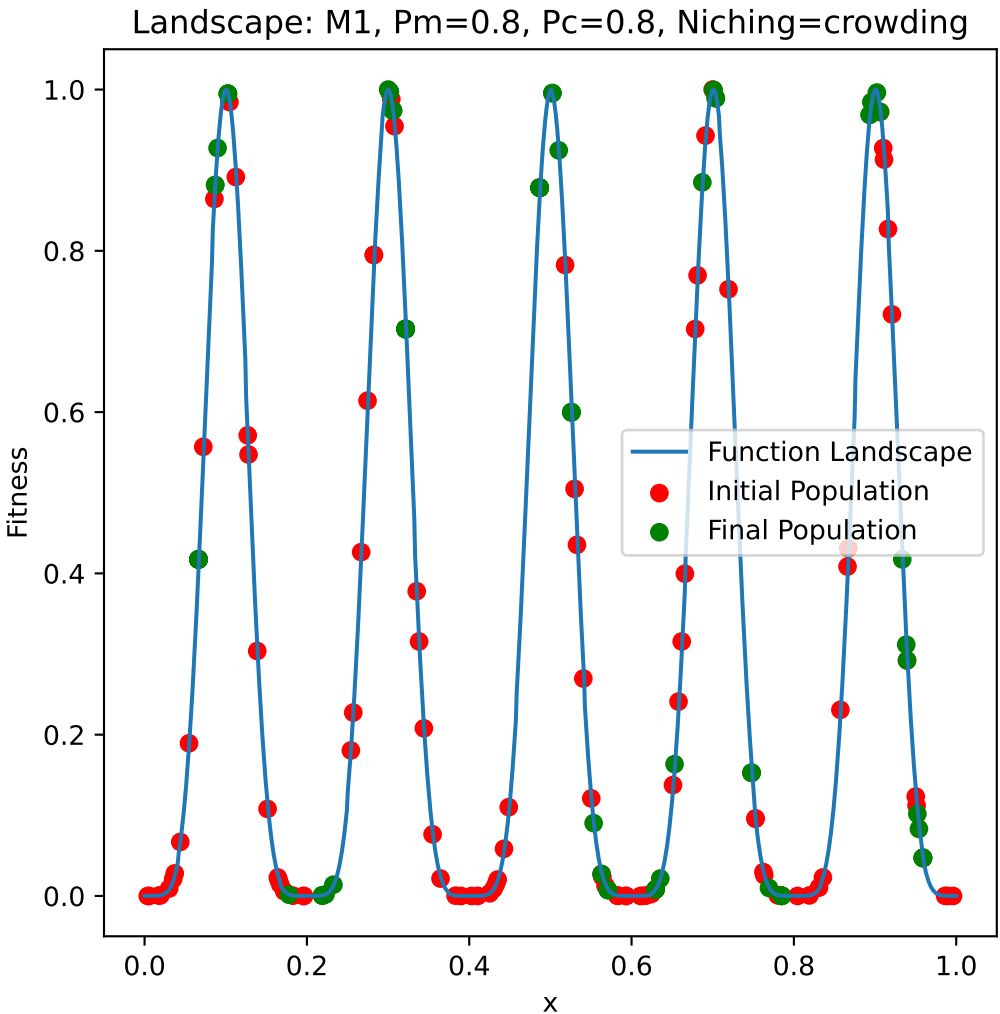

Fitness: M1, Pm=0.8, Pc=0.2, Niching=crowding
Avg Fmax
Avg Favg
Avg Fmin
Fitness
Generation
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100

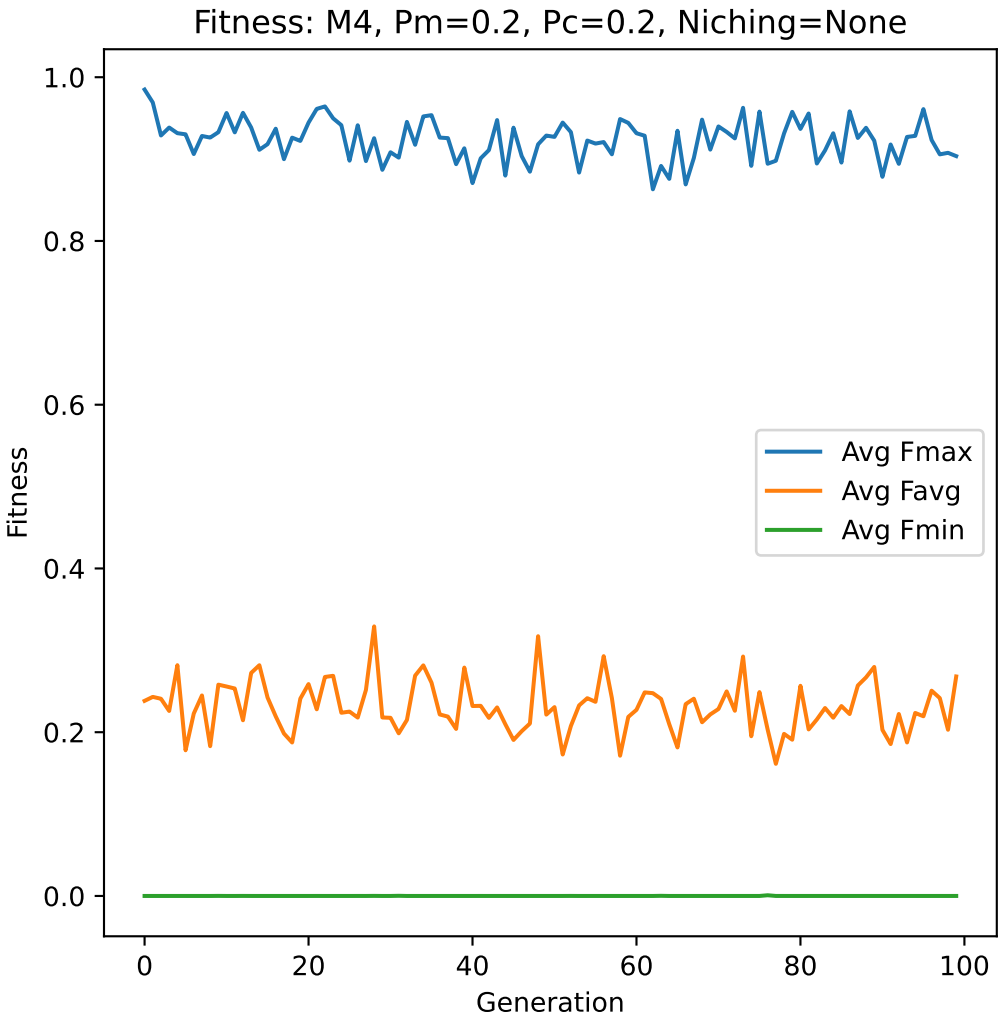

Landscape: M1, Pm=0.8, Pc=0.2, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

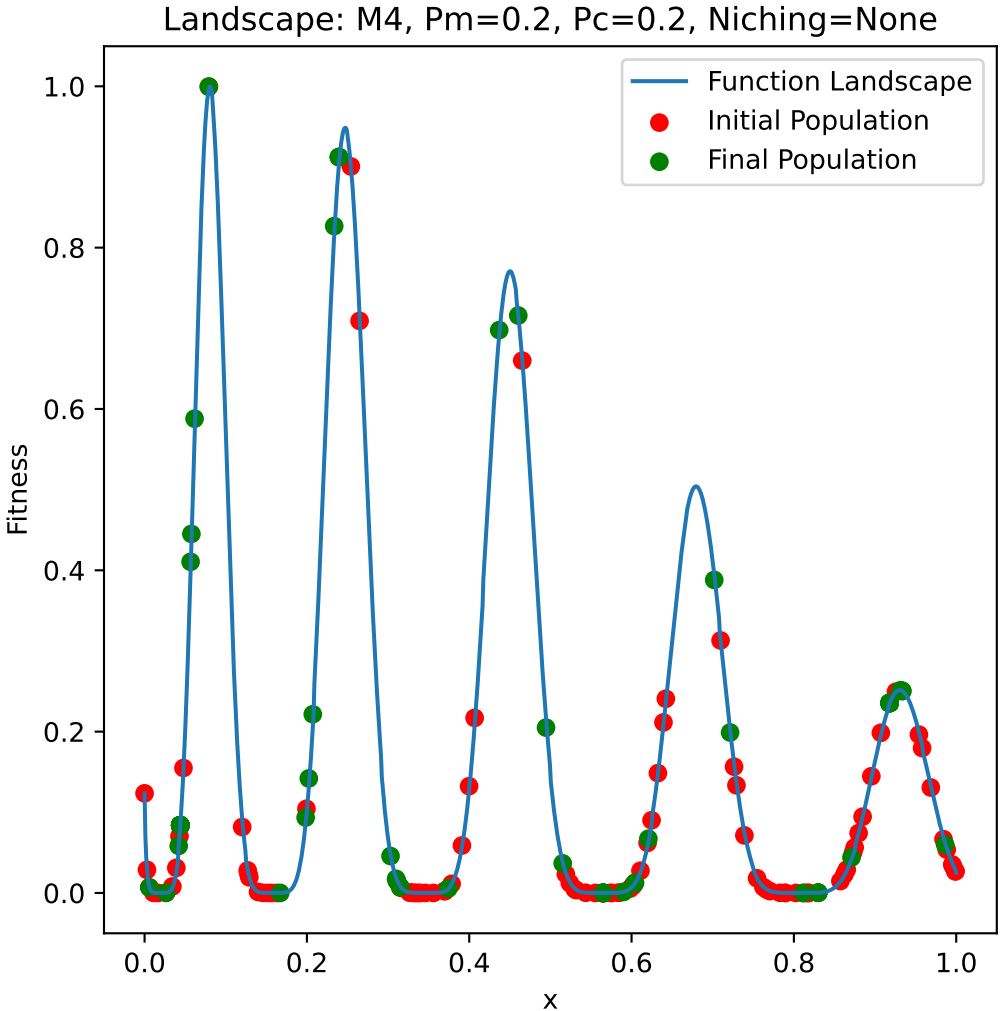

Fitness: M1, Pm=0.8, Pc=0.5, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
20
40
60
80
100
Generation

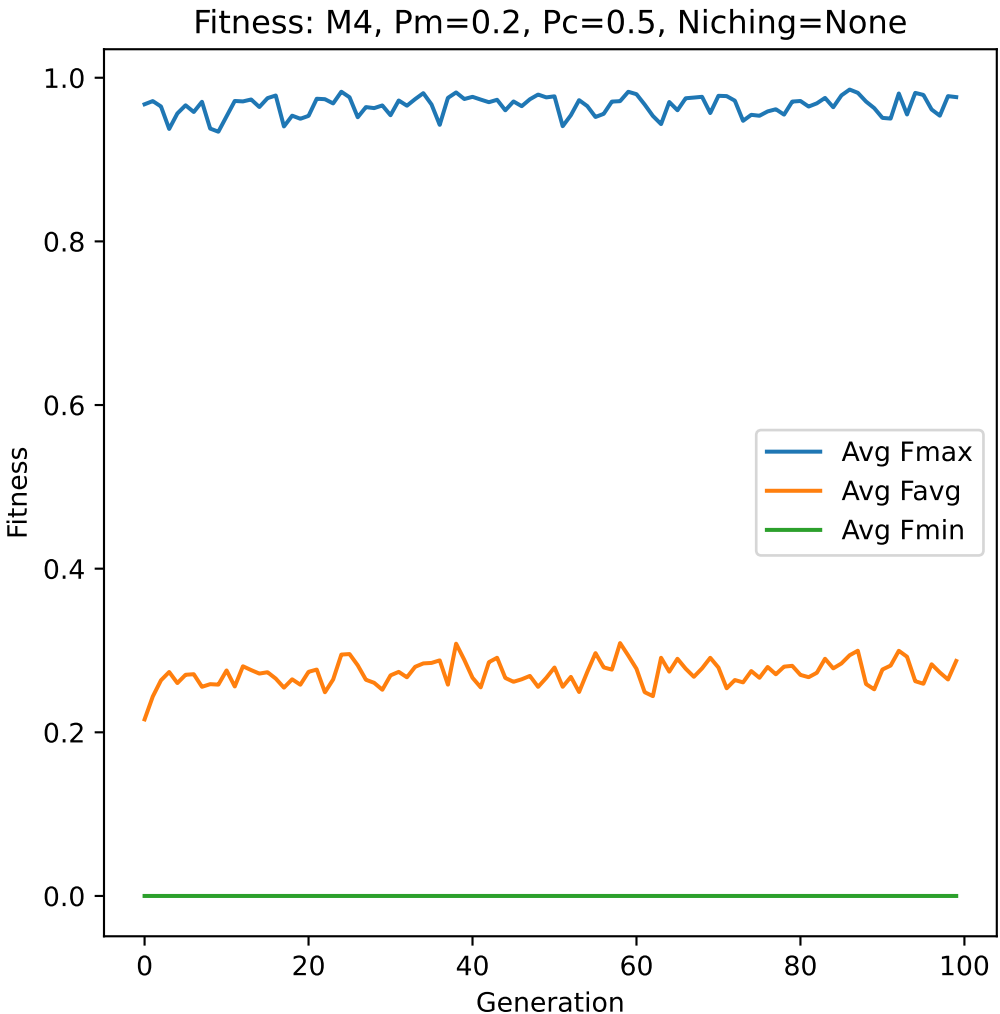

Landscape: M1, Pm=0.8, Pc=0.5, Niching=crowding
Fitness
x
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

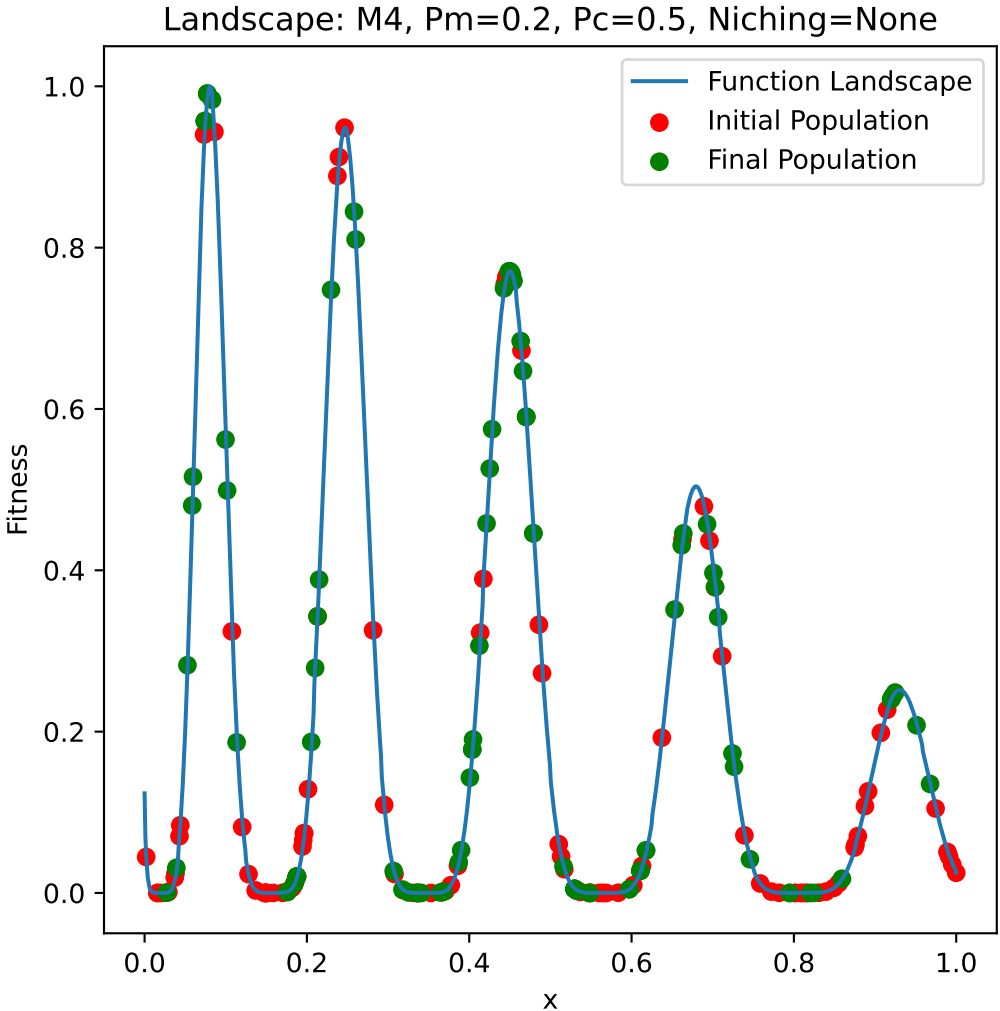

Fitness: M1, Pm=0.8, Pc=0.8, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

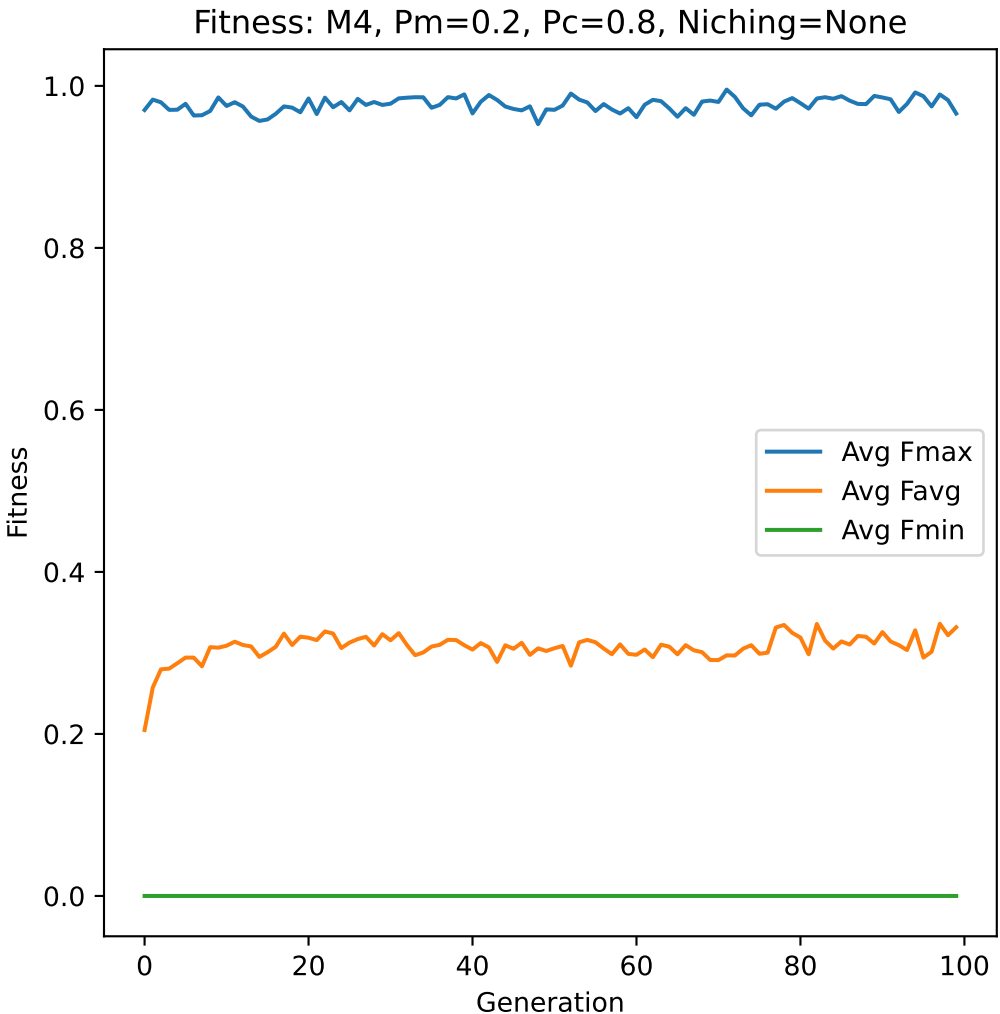

Landscape: M1, Pm=0.8, Pc=0.8, Niching=crowding
Fitness
x
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Function Landscape
Initial Population
Final Population

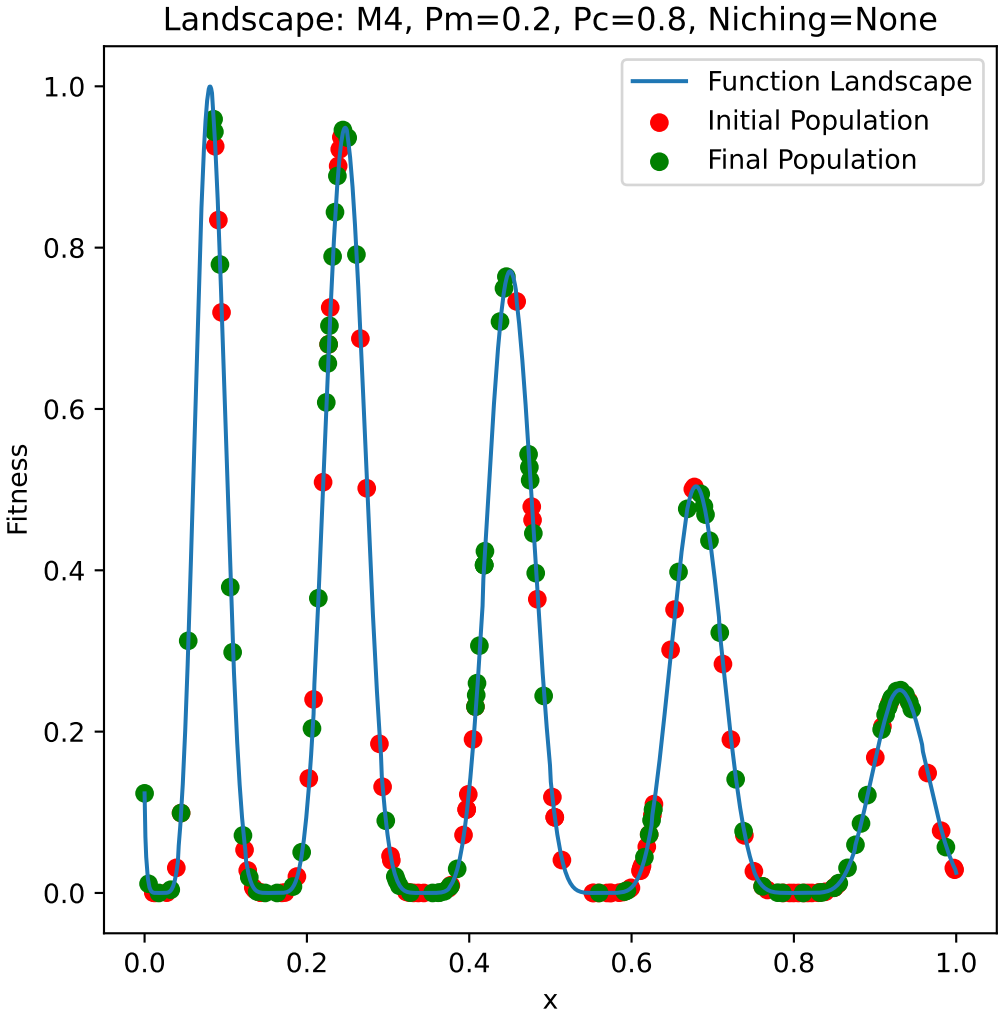

Fitness: M4, Pm=0.2, Pc=0.2, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

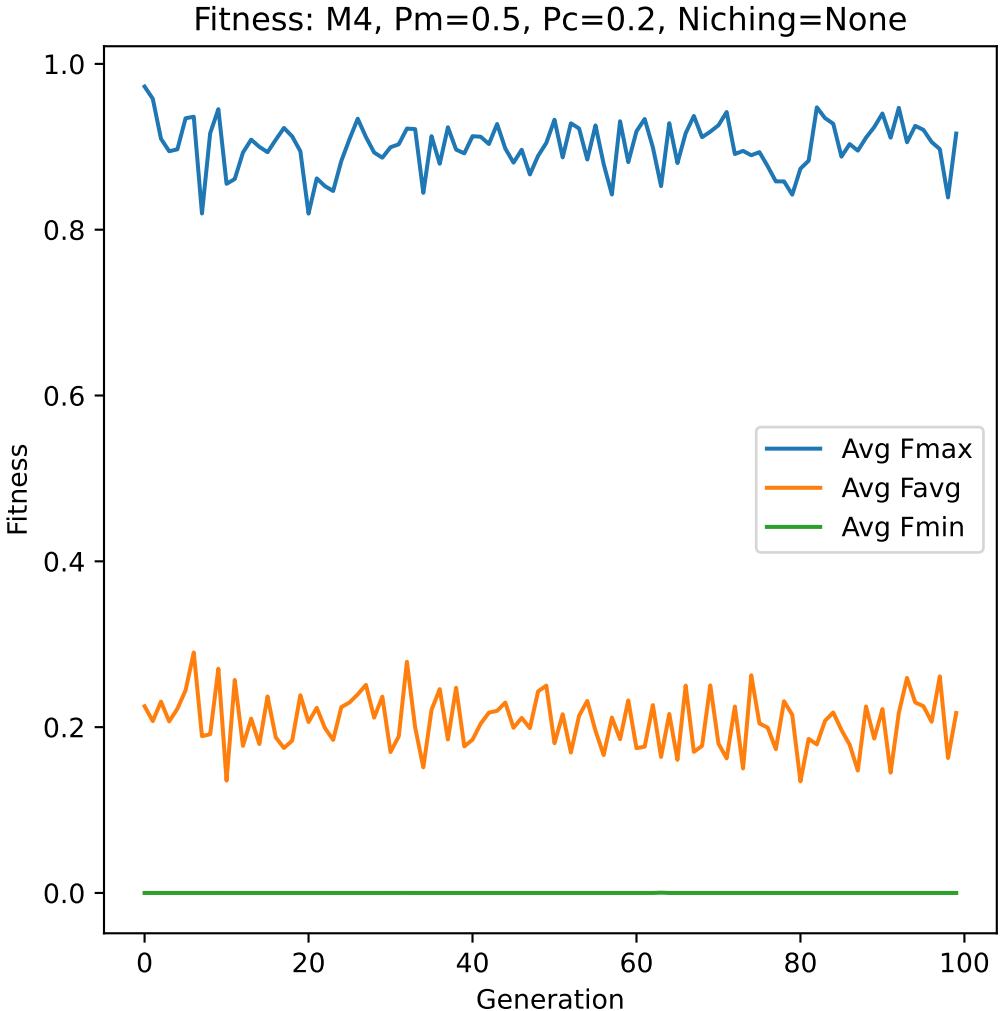

Landscape: M4, Pm=0.2, Pc=0.2, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

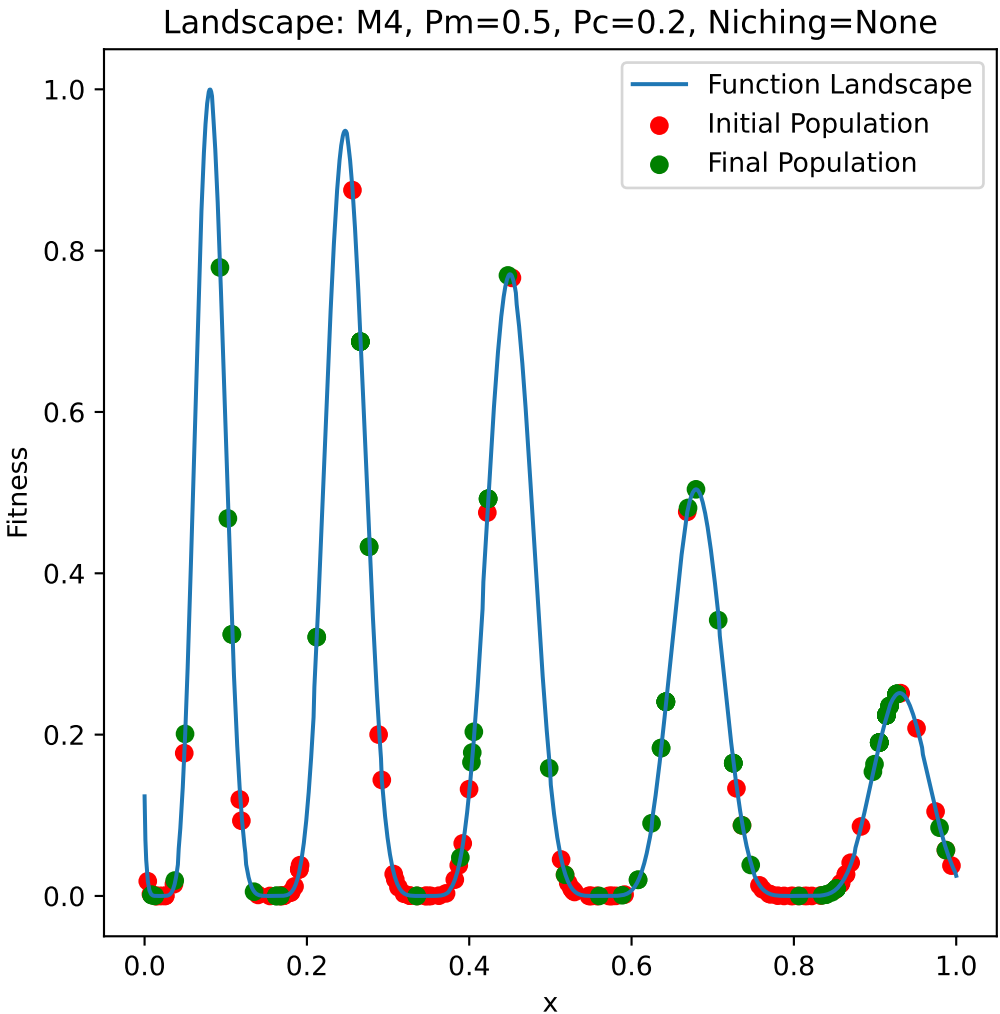

Fitness: M4, Pm=0.2, Pc=0.5, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

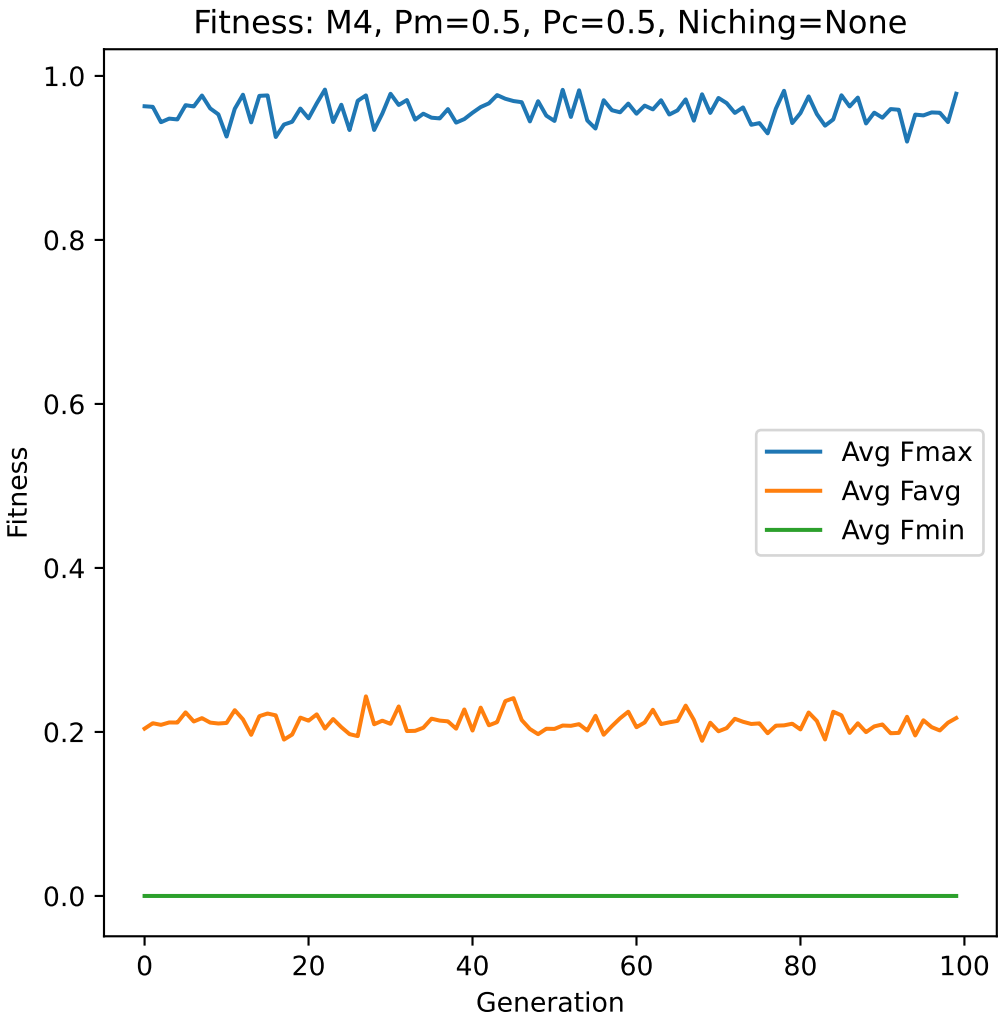

Landscape: M4, Pm=0.2, Pc=0.5, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

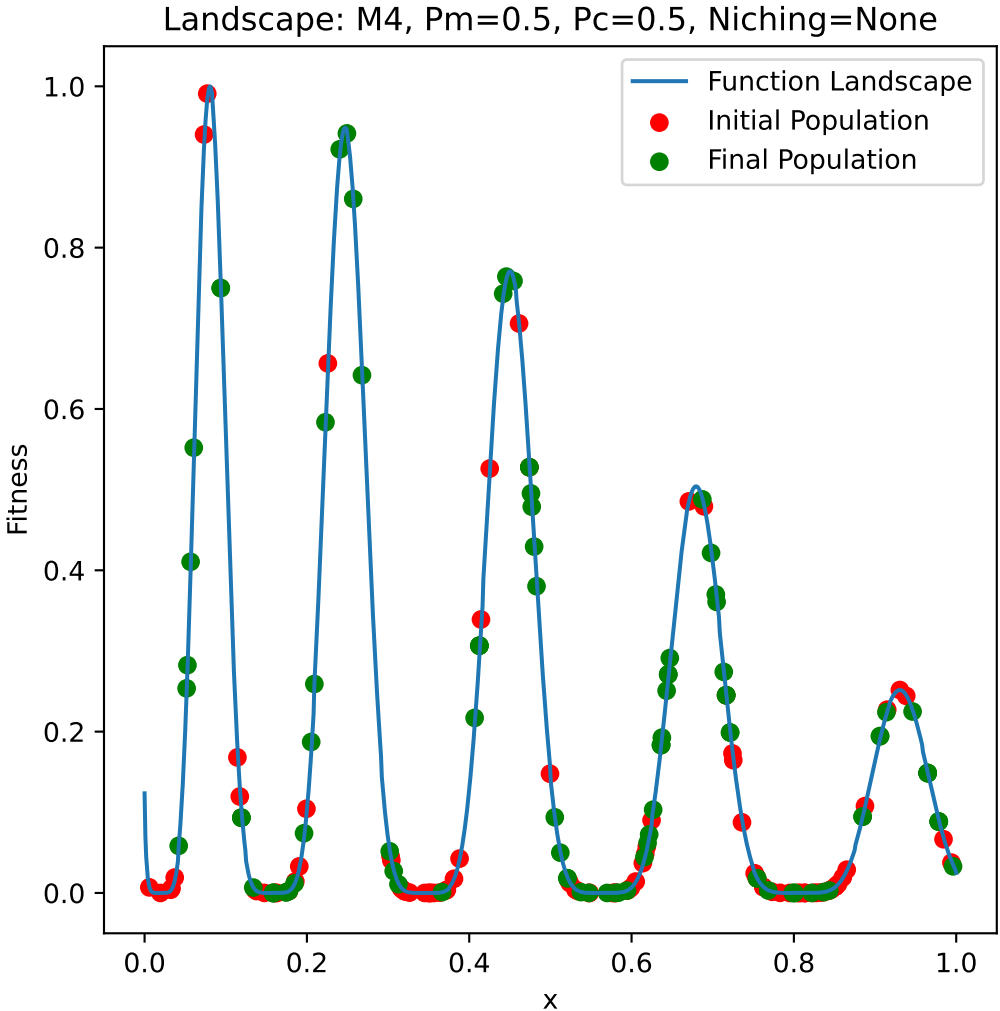

Fitness: M4, Pm=0.2, Pc=0.8, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

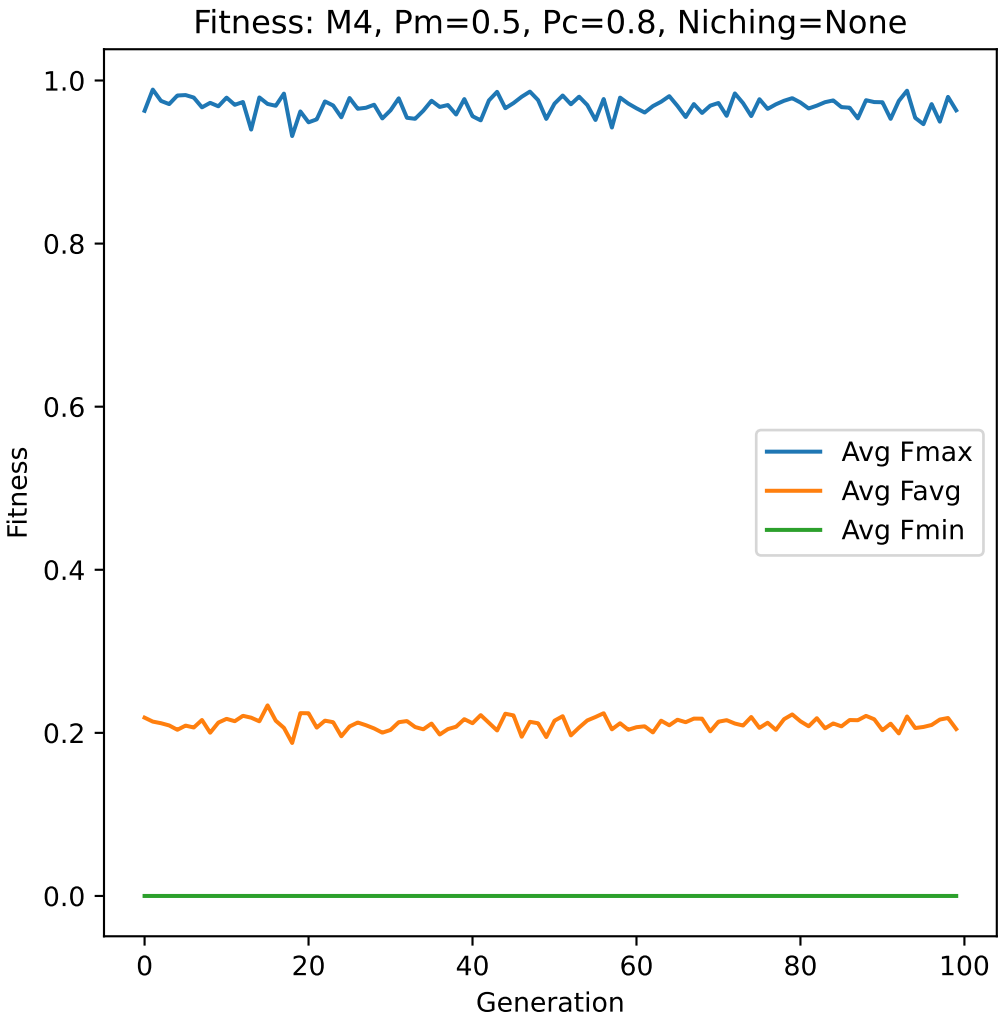

Landscape: M4, Pm=0.2, Pc=0.8, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

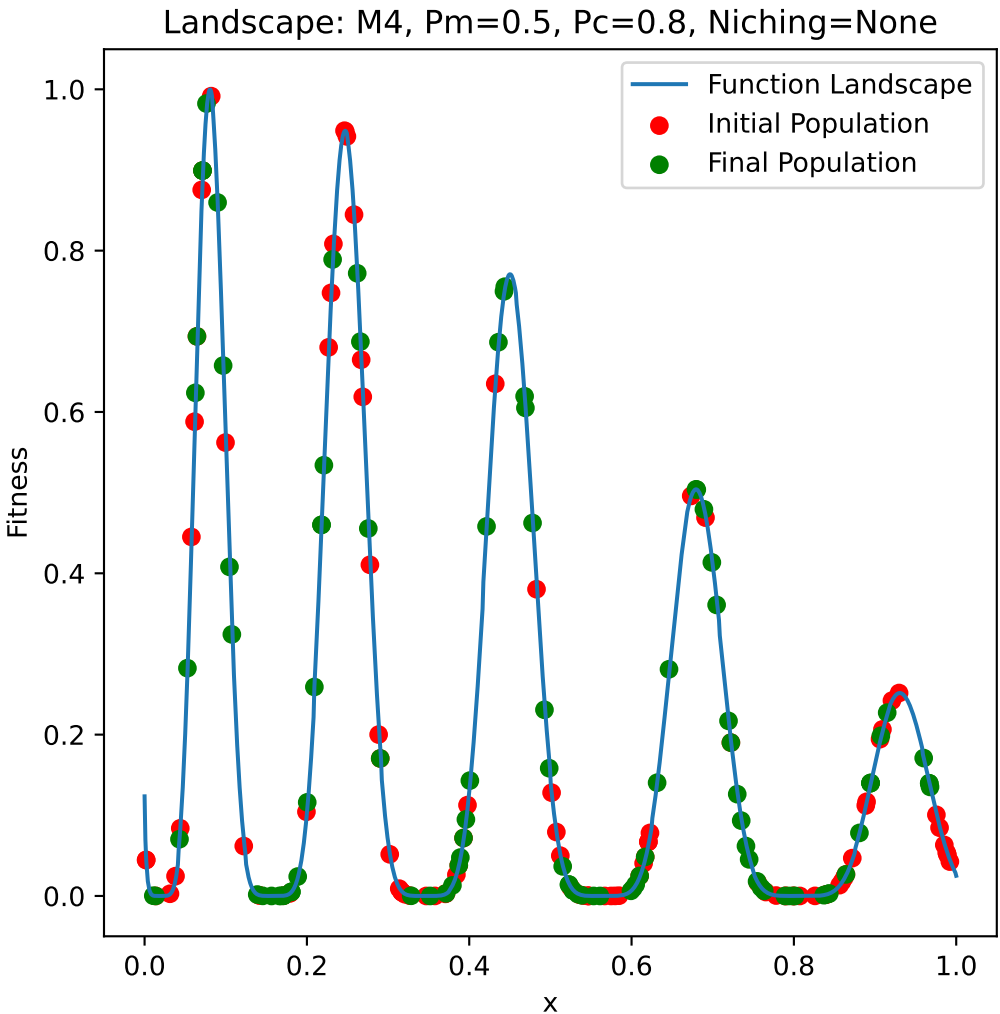

Fitness: M4, Pm=0.5, Pc=0.2, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

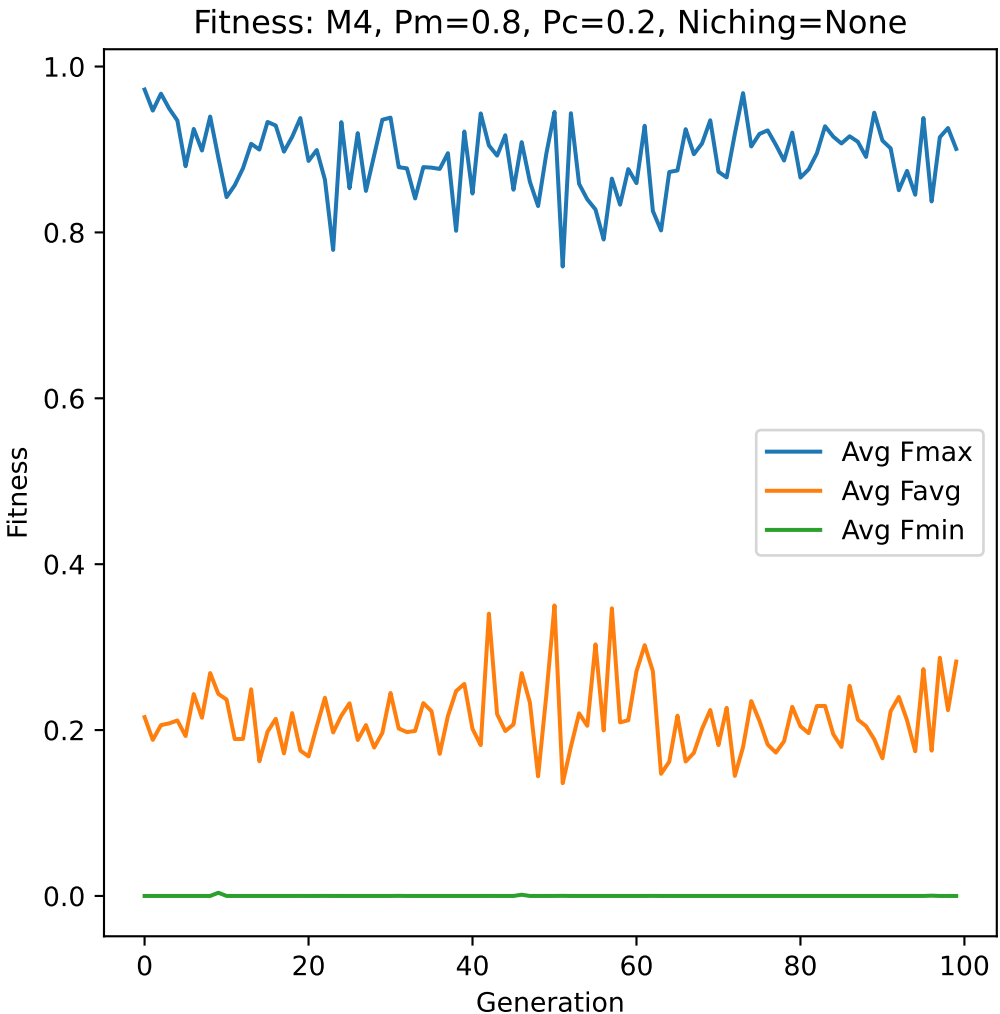

Landscape: M4, Pm=0.5, Pc=0.2, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

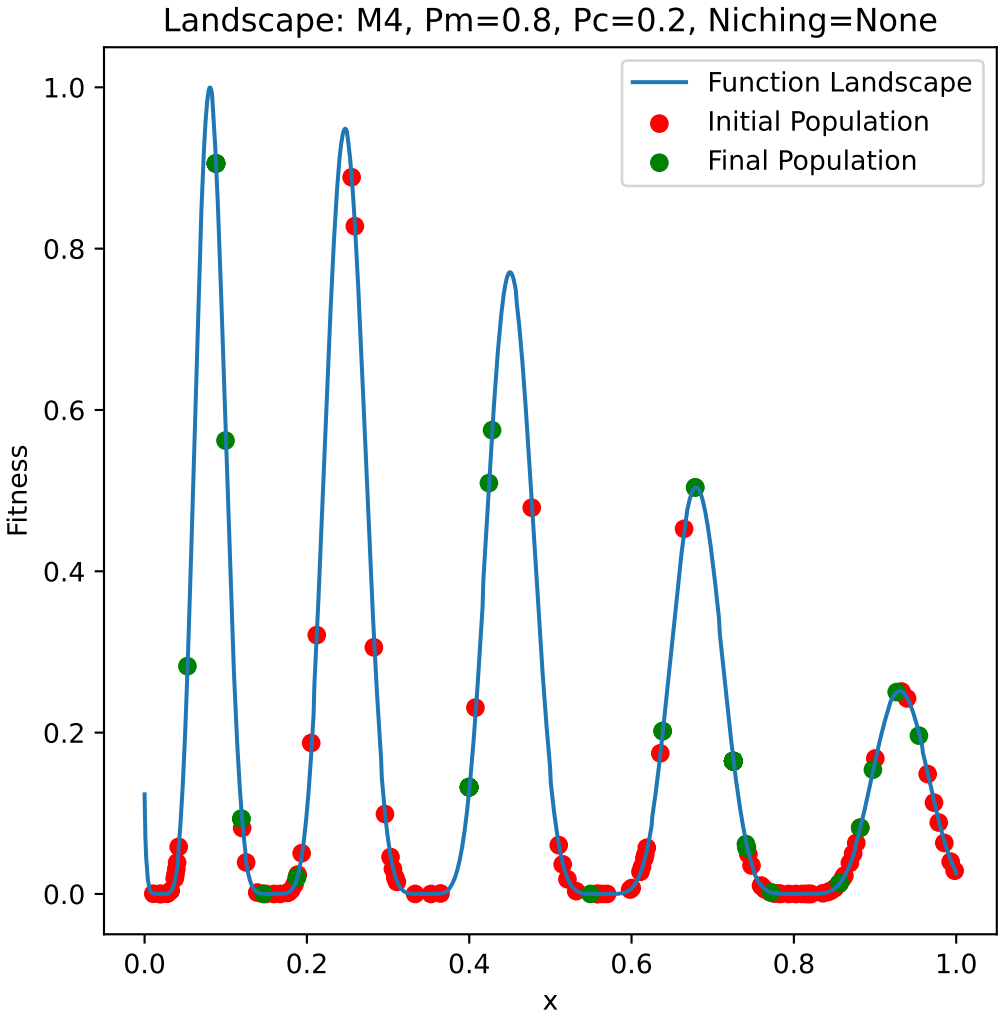

Fitness: M4, Pm=0.5, Pc=0.5, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

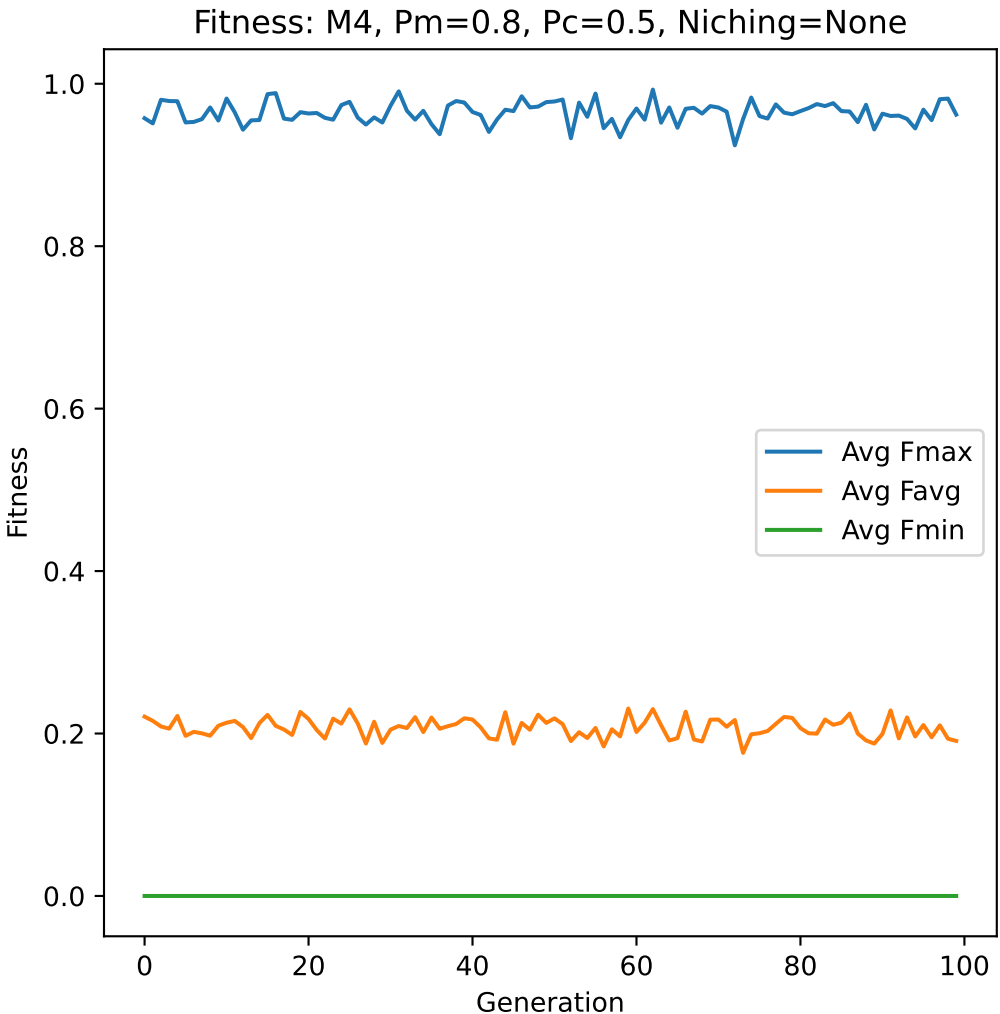

Landscape: M4, Pm=0.5, Pc=0.5, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

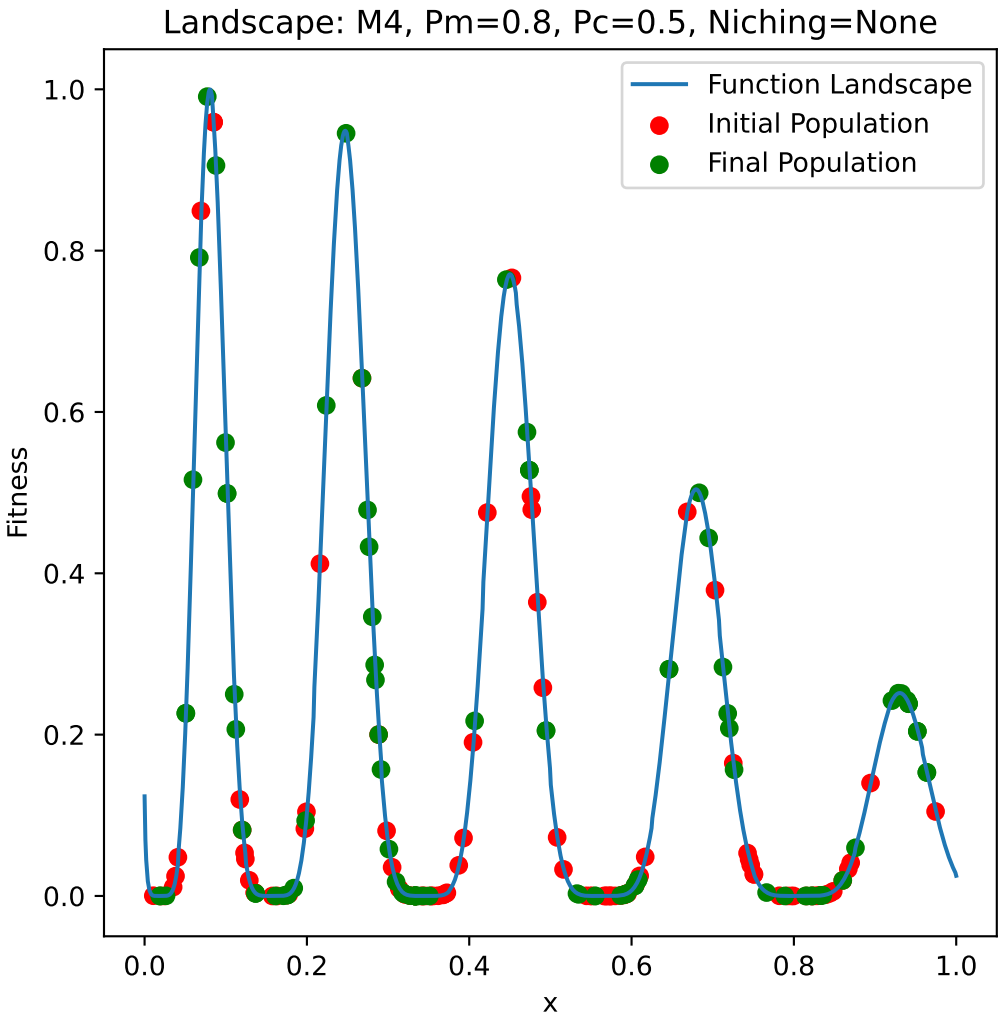

Fitness: M4, Pm=0.5, Pc=0.8, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

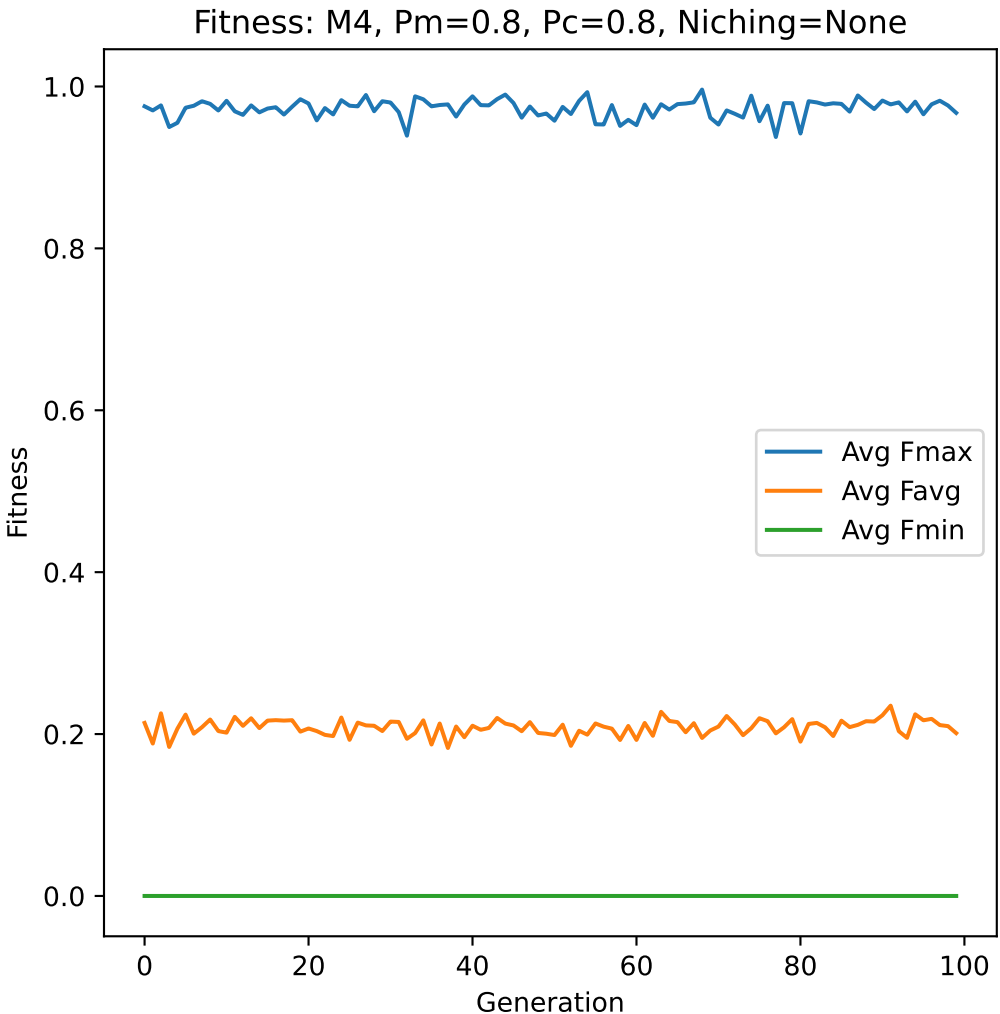

Landscape: M4, Pm=0.5, Pc=0.8, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

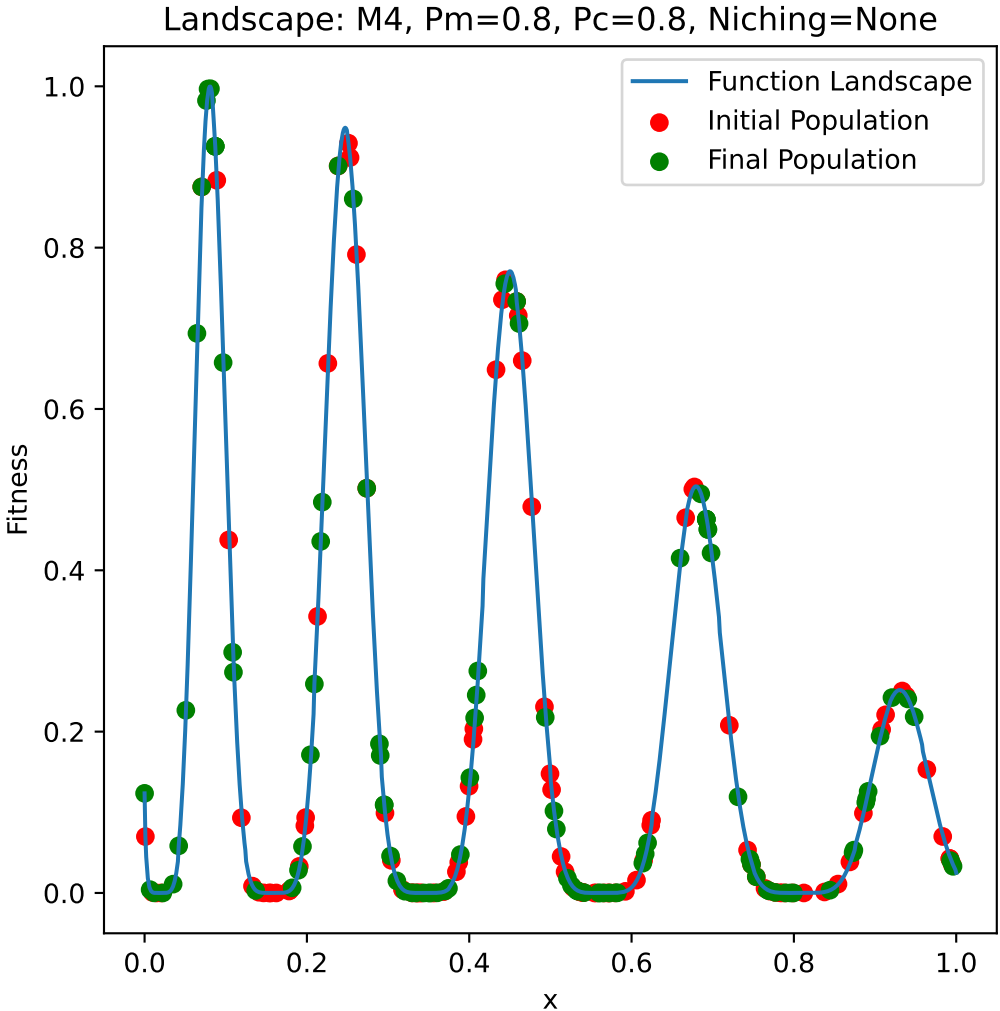

Fitness: M4, Pm=0.8, Pc=0.2, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

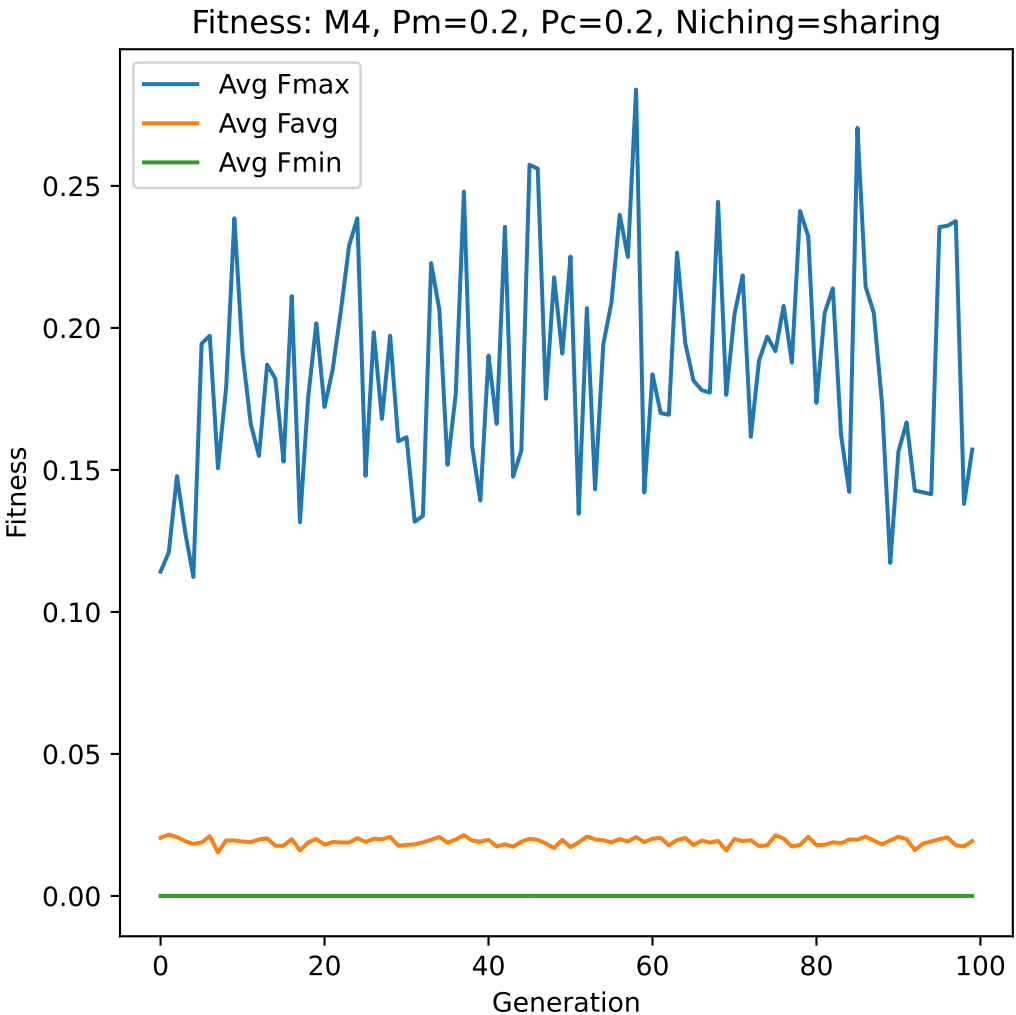

Landscape: M4, Pm=0.8, Pc=0.2, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

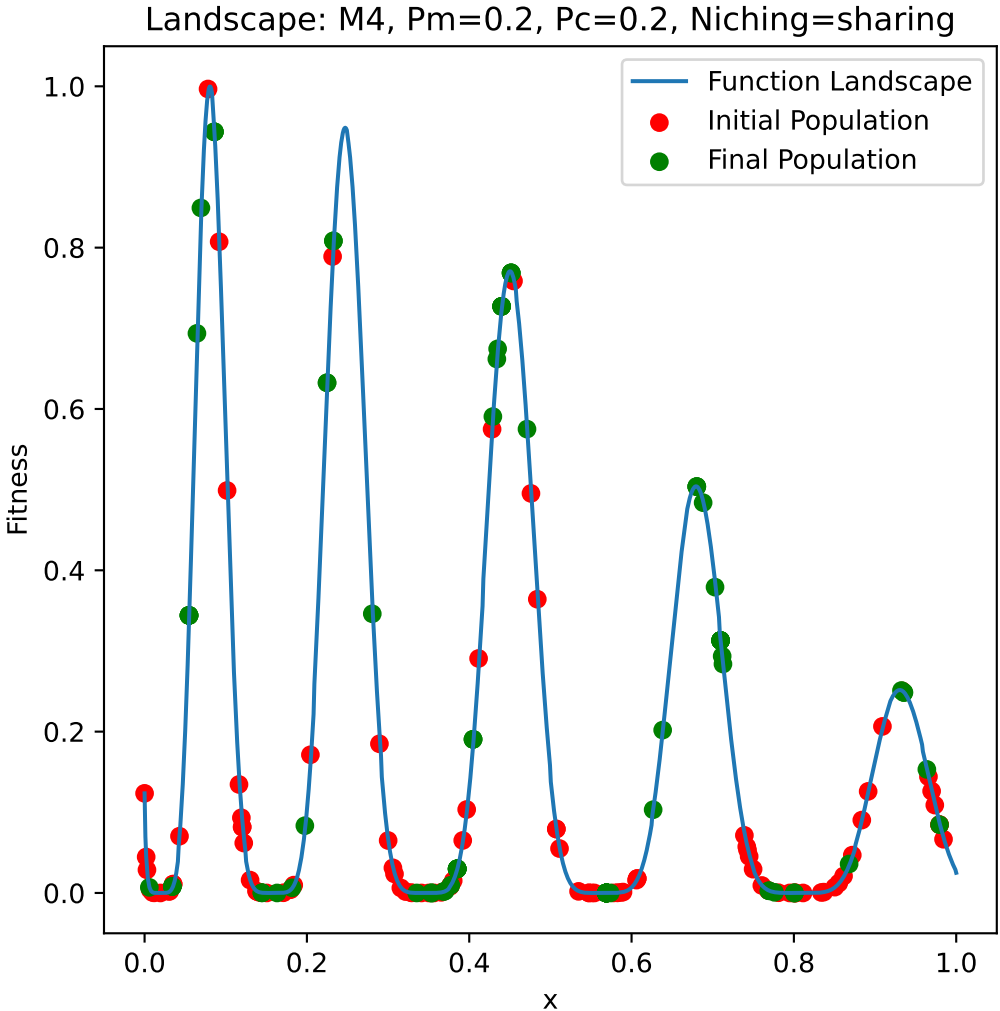

Fitness: M4, Pm=0.8, Pc=0.5, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

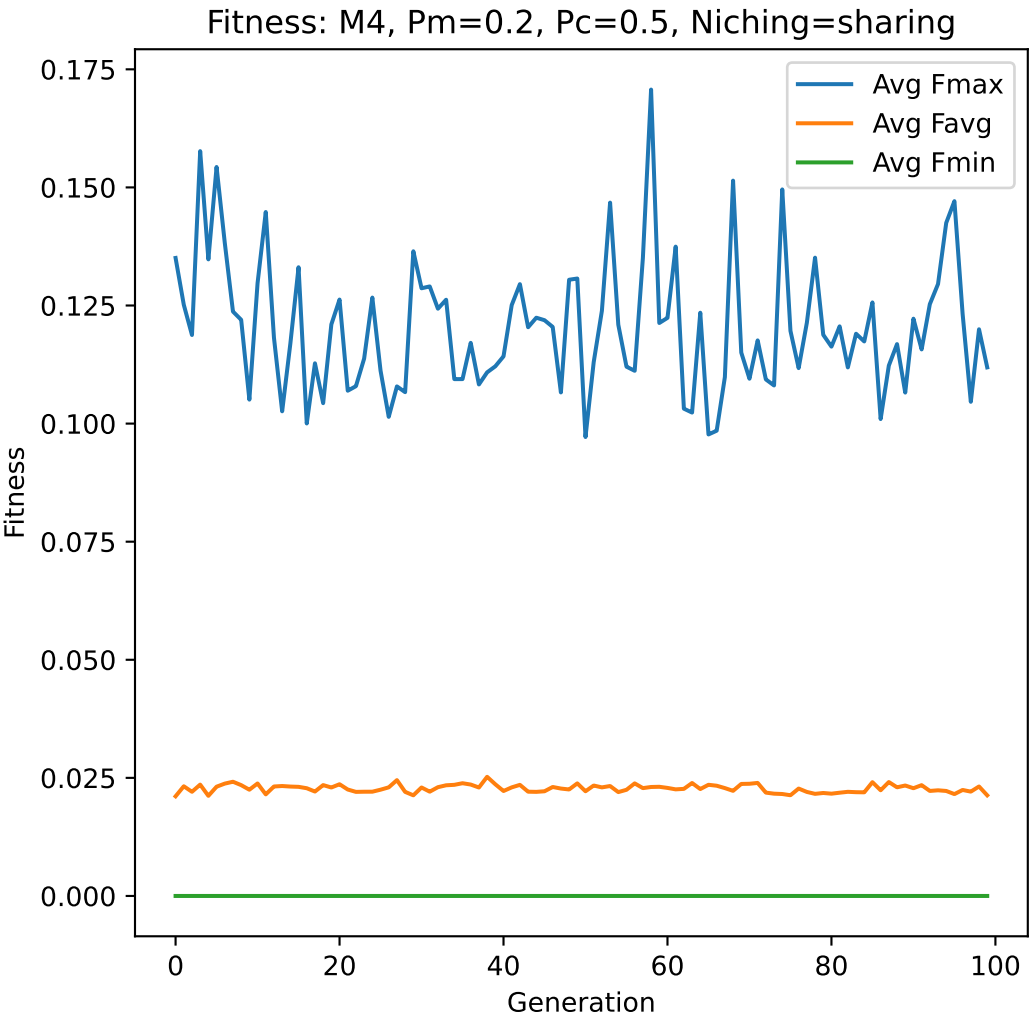

Landscape: M4, Pm=0.8, Pc=0.5, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

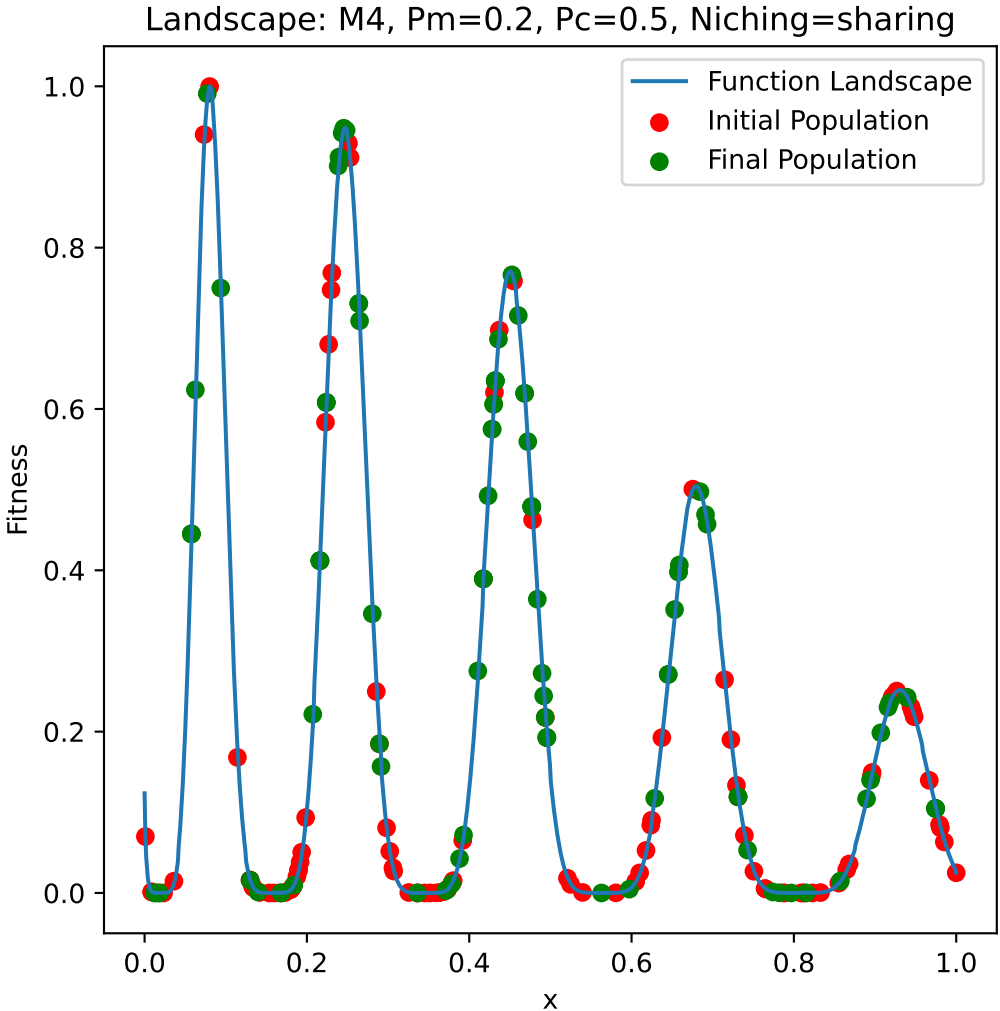

Fitness: M4, Pm=0.8, Pc=0.8, Niching=None
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

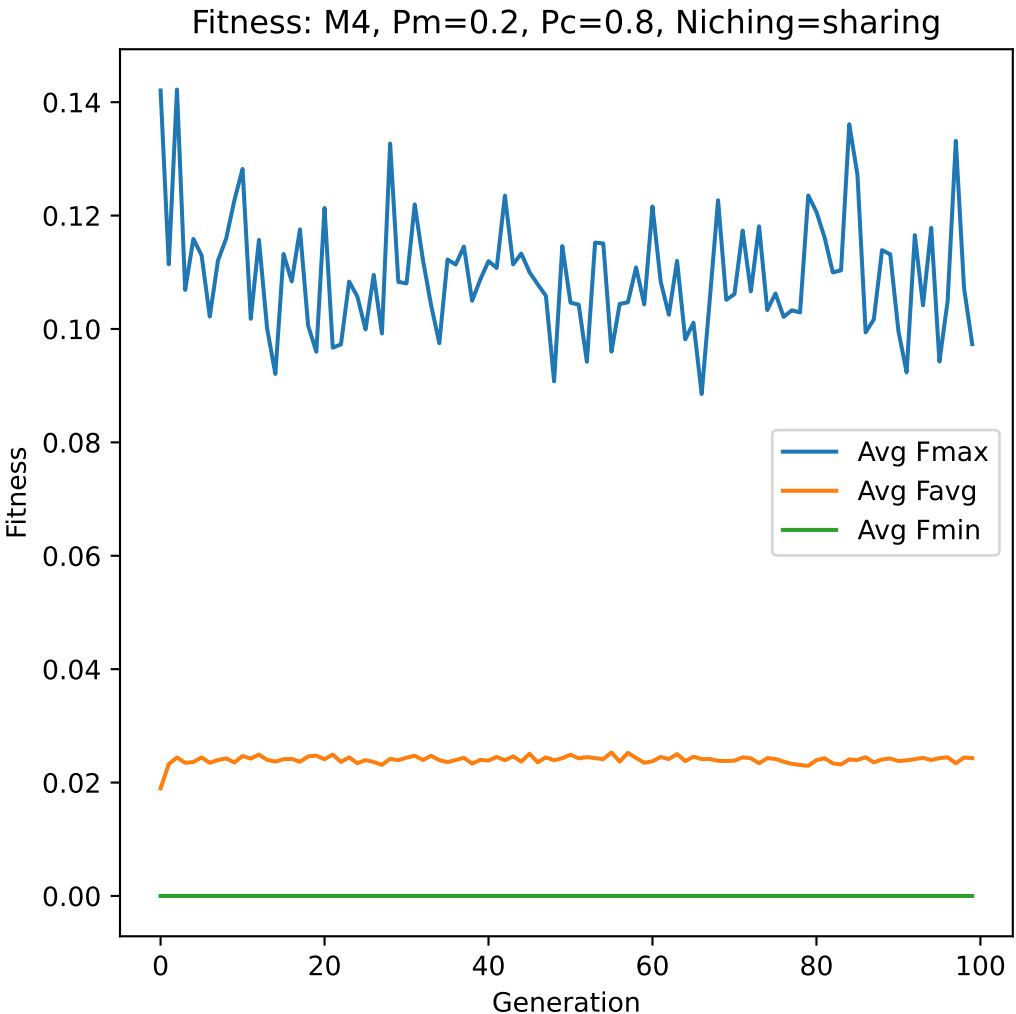

Landscape: M4, Pm=0.8, Pc=0.8, Niching=None
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

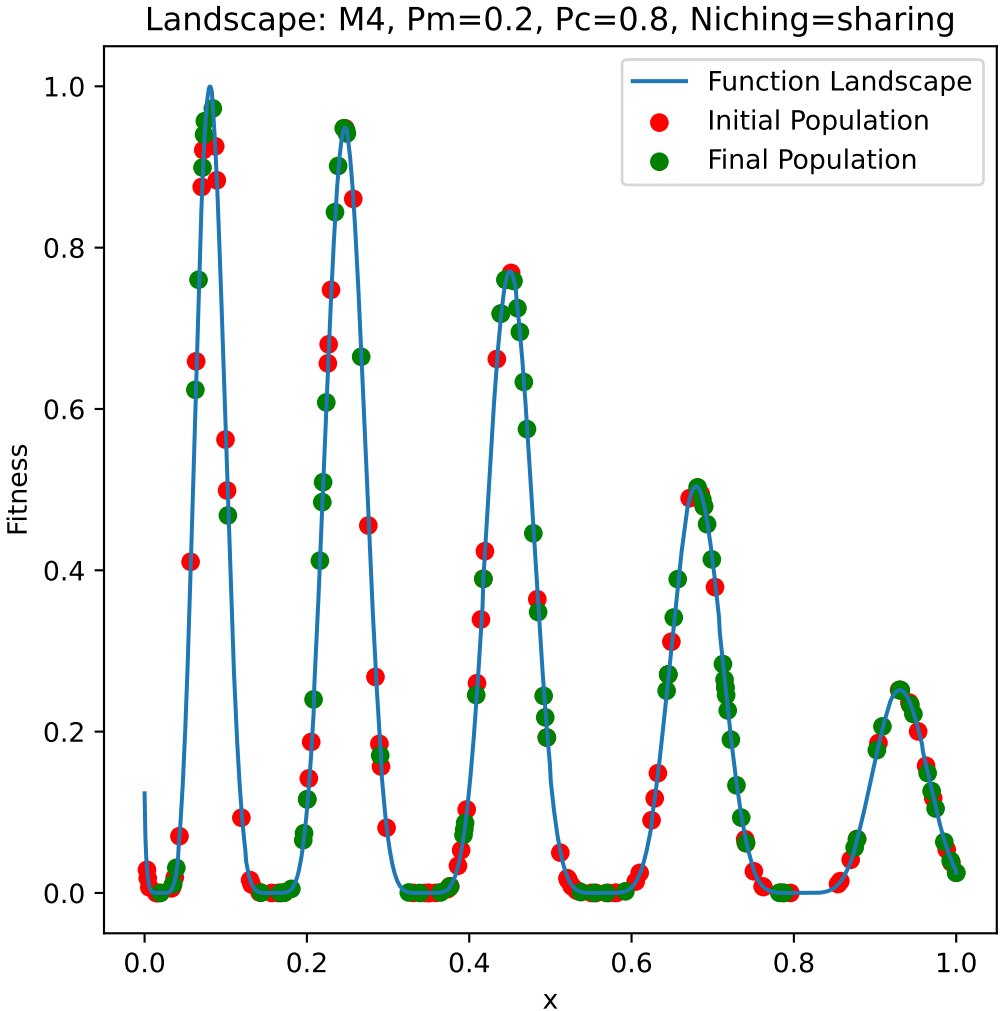

Fitness: M4, Pm=0.2, Pc=0.2, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
Fitness
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
Generation

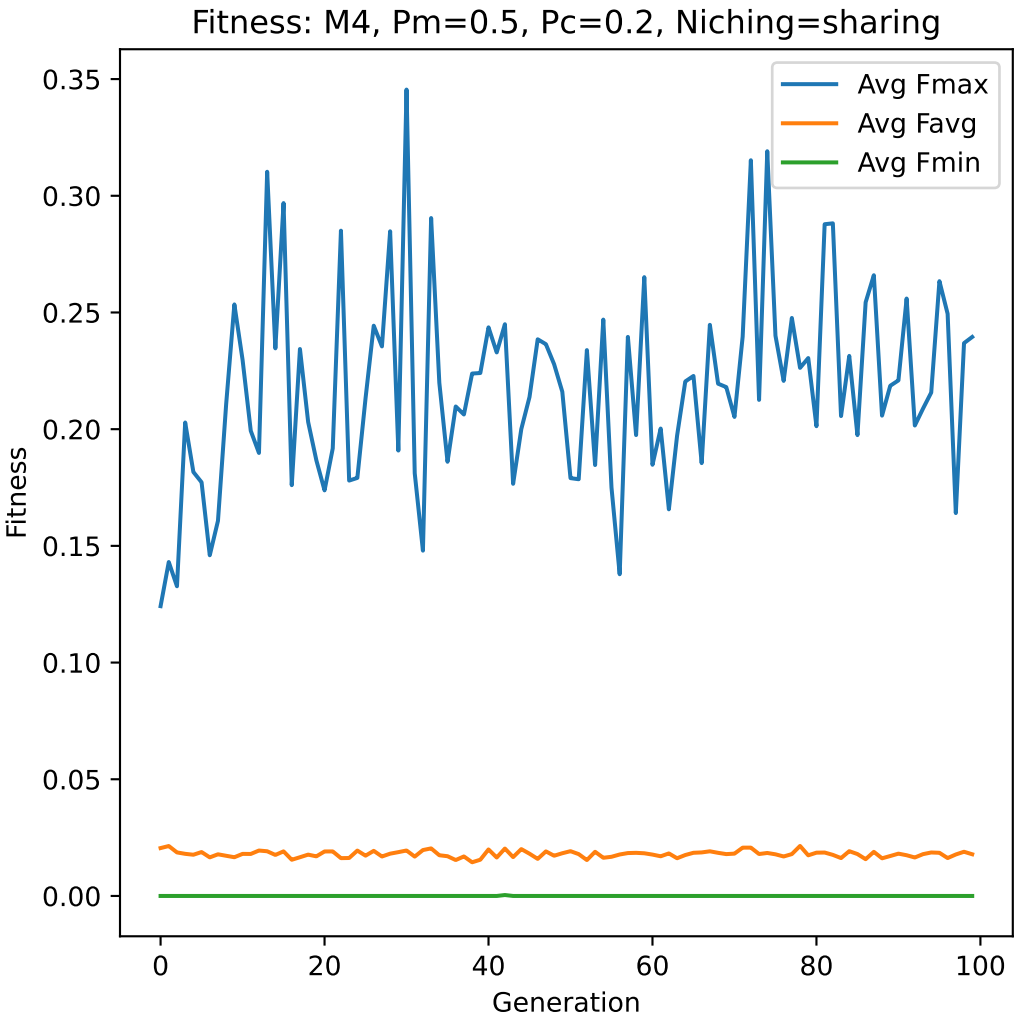

Landscape: M4, Pm=0.2, Pc=0.2, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

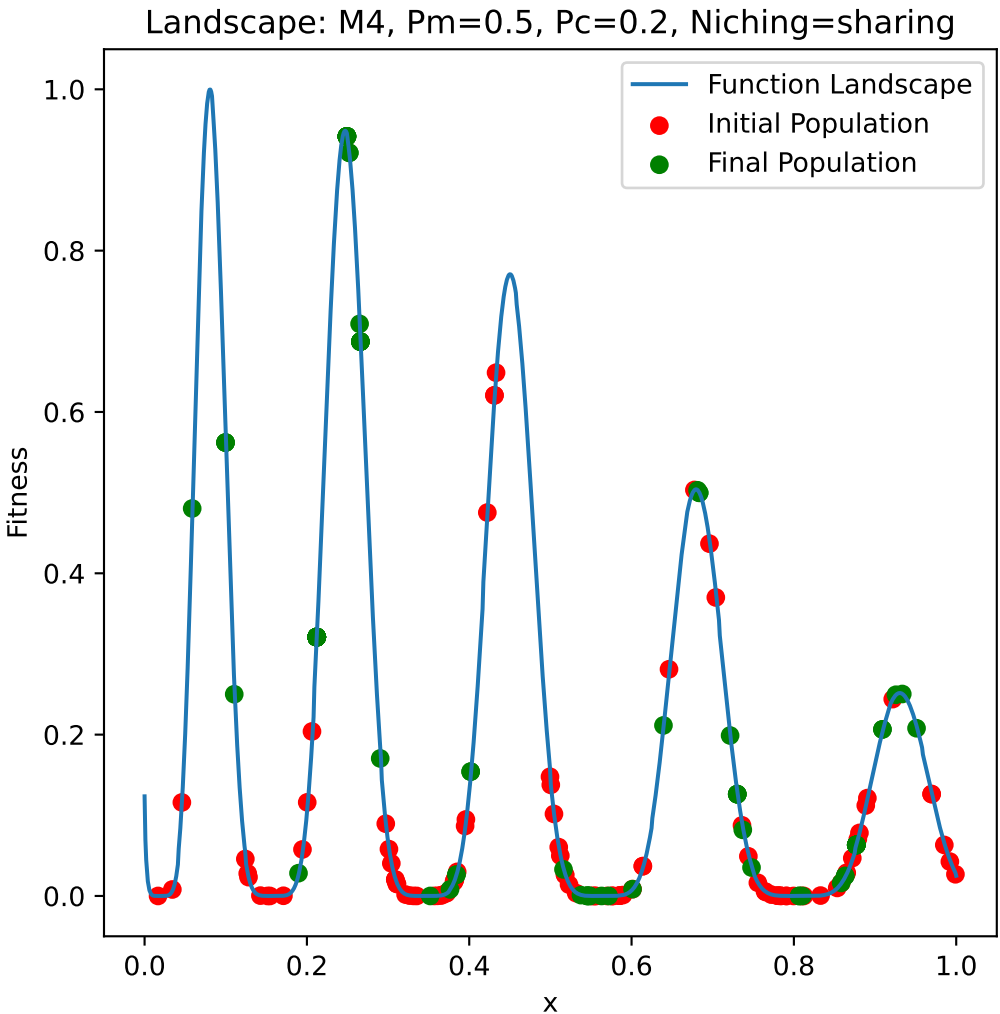

Fitness: M4, Pm=0.2, Pc=0.5, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
0
20
40
60
80
100
Generation

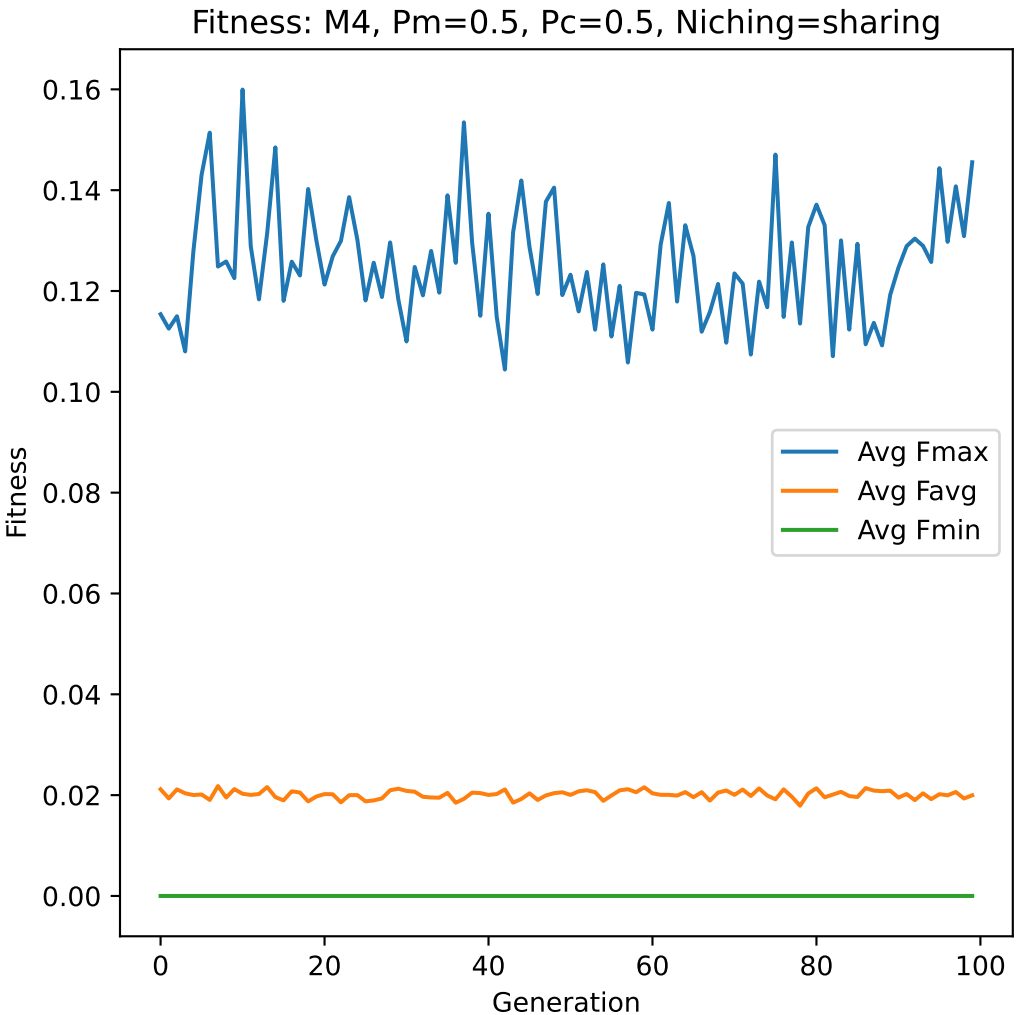

Landscape: M4, Pm=0.2, Pc=0.5, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

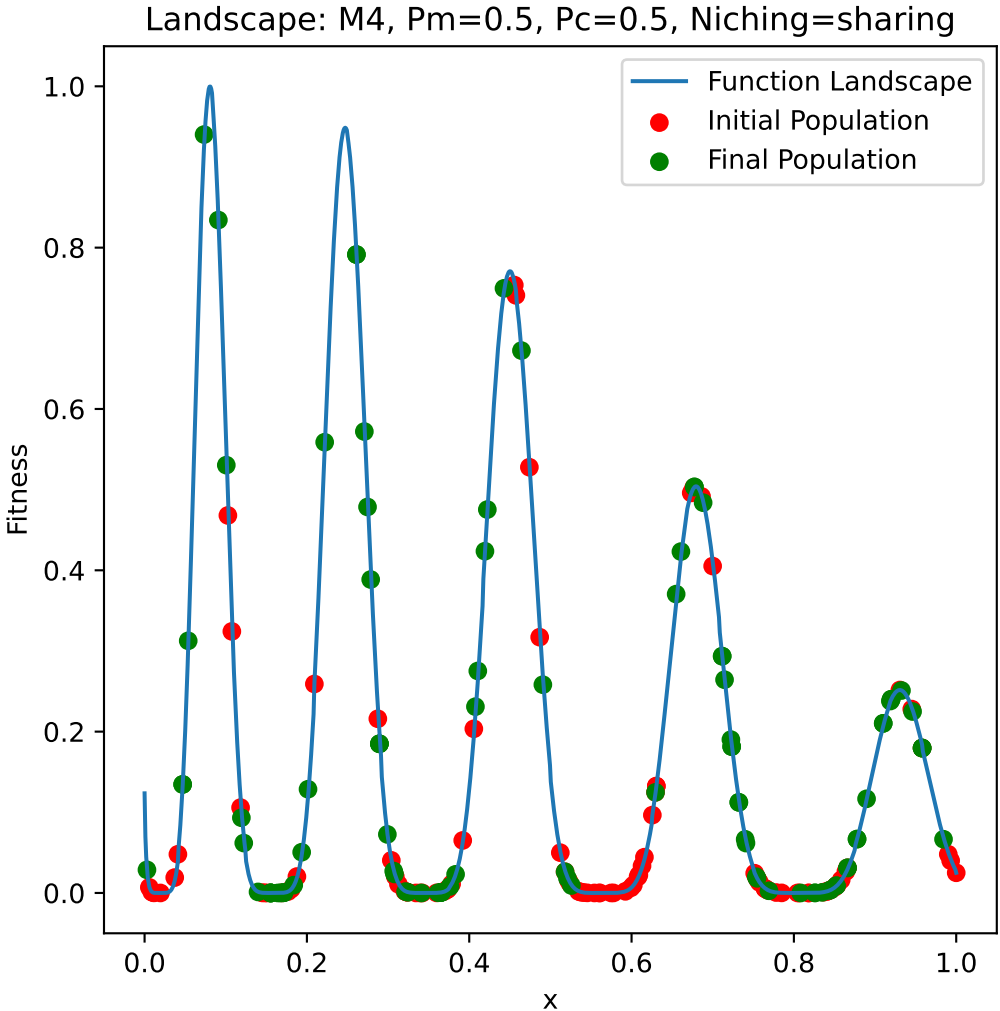

Fitness: M4, Pm=0.2, Pc=0.8, Niching=sharing
Fitness
Generation
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0
20
40
60
80
100
Avg Fmax
Avg Favg
Avg Fmin

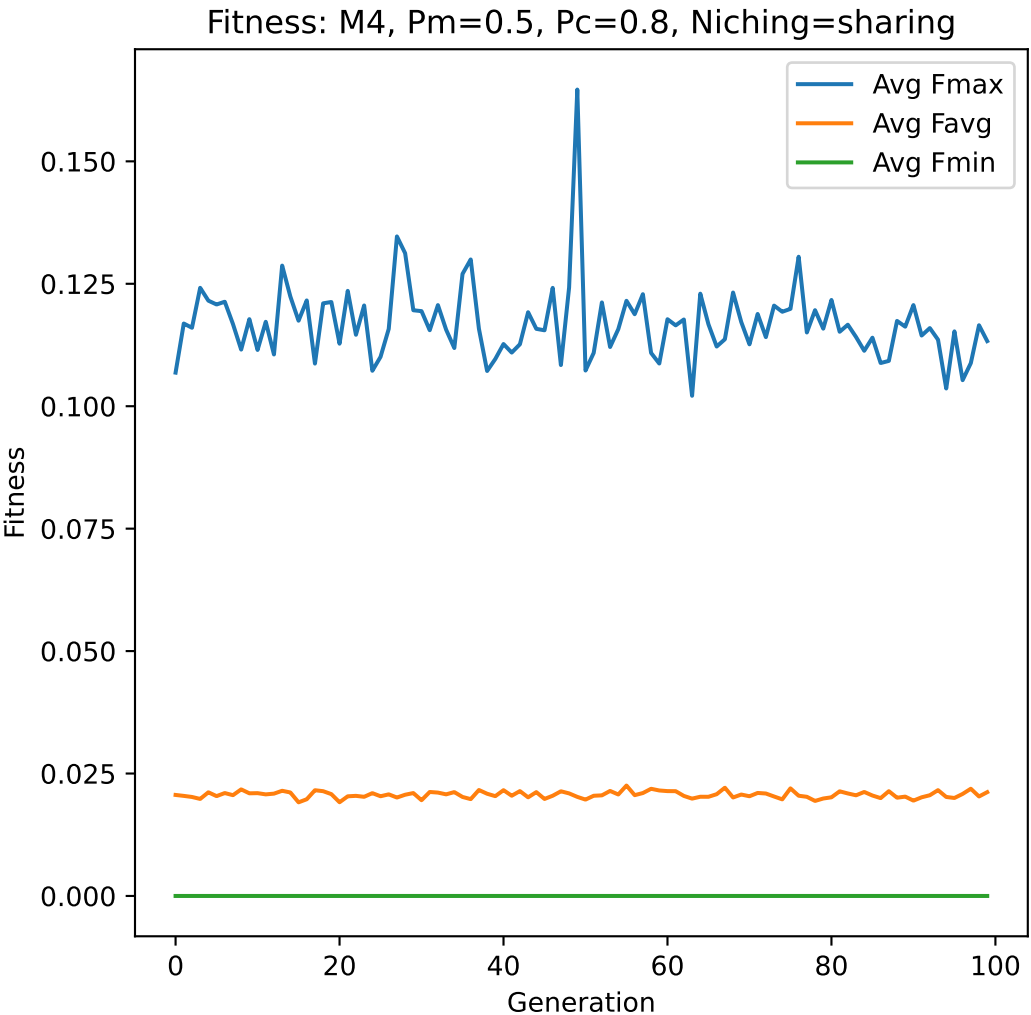

Landscape: M4, Pm=0.2, Pc=0.8, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

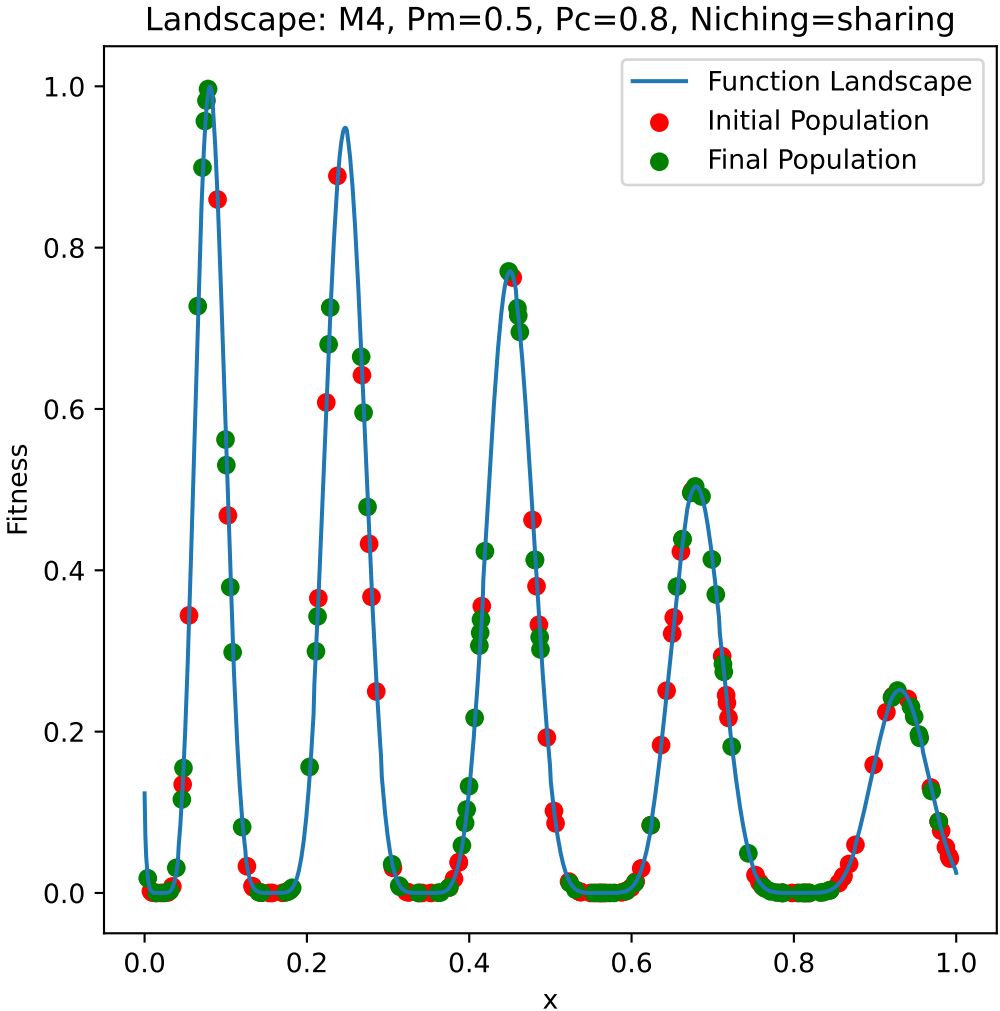

Fitness: M4, Pm=0.5, Pc=0.2, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
Fitness
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
Generation

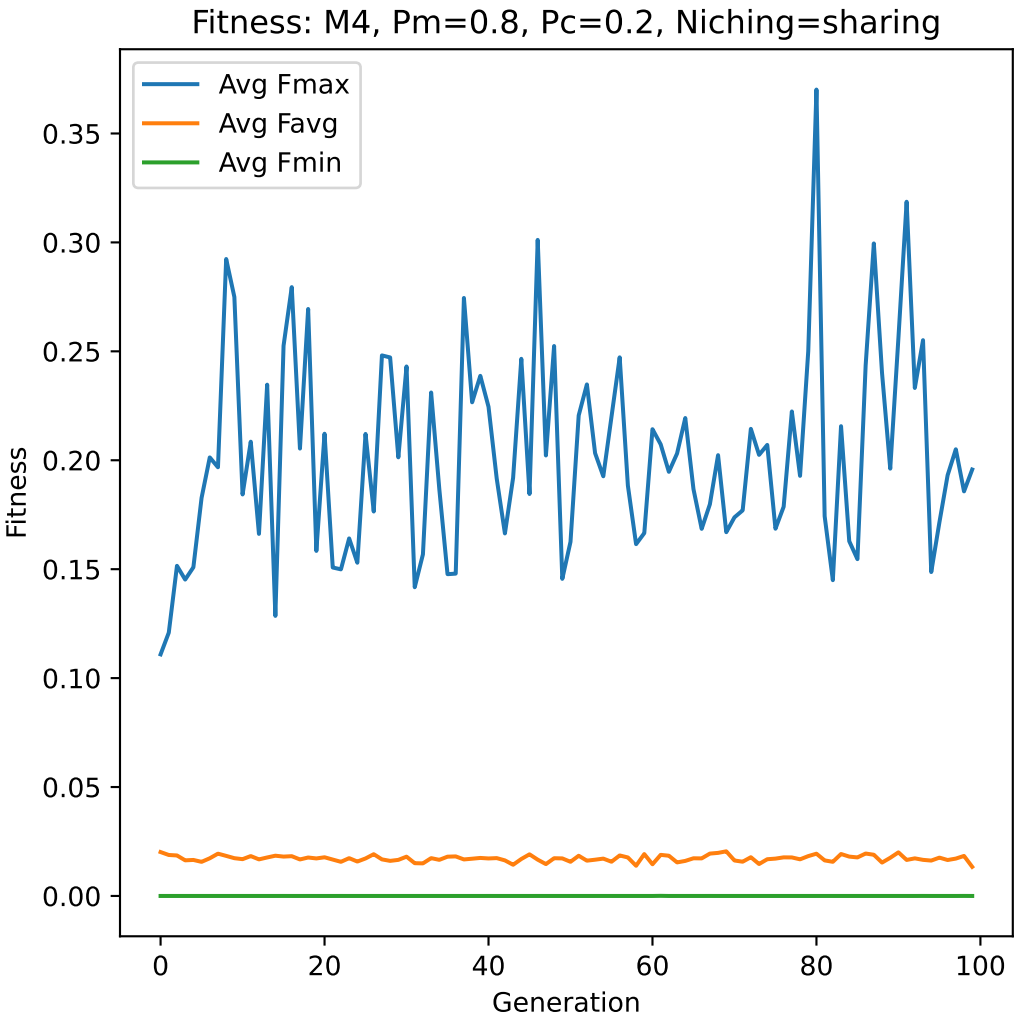

Landscape: M4, Pm=0.5, Pc=0.2, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

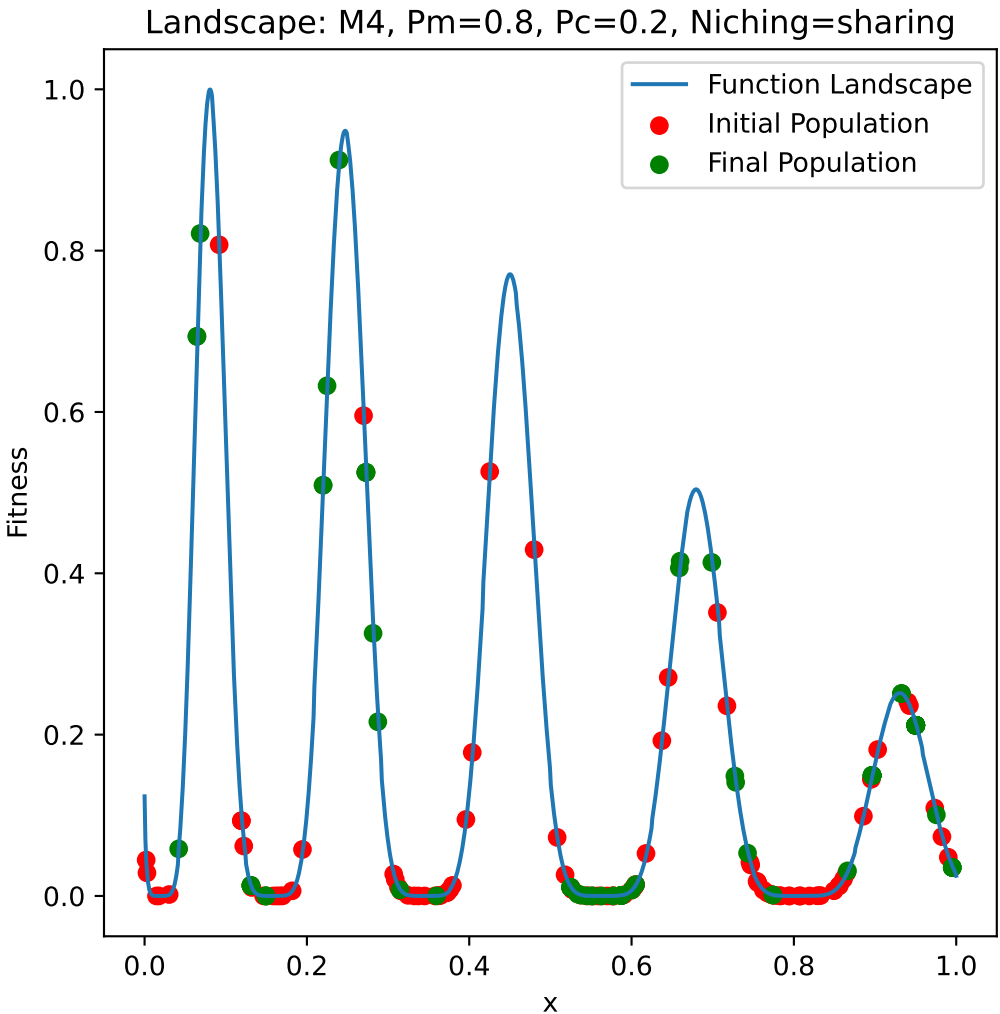

Fitness: M4, Pm=0.5, Pc=0.5, Niching=sharing
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Fitness
Avg Fmax
Avg Favg
Avg Fmin
0
20
40
60
80
100
Generation

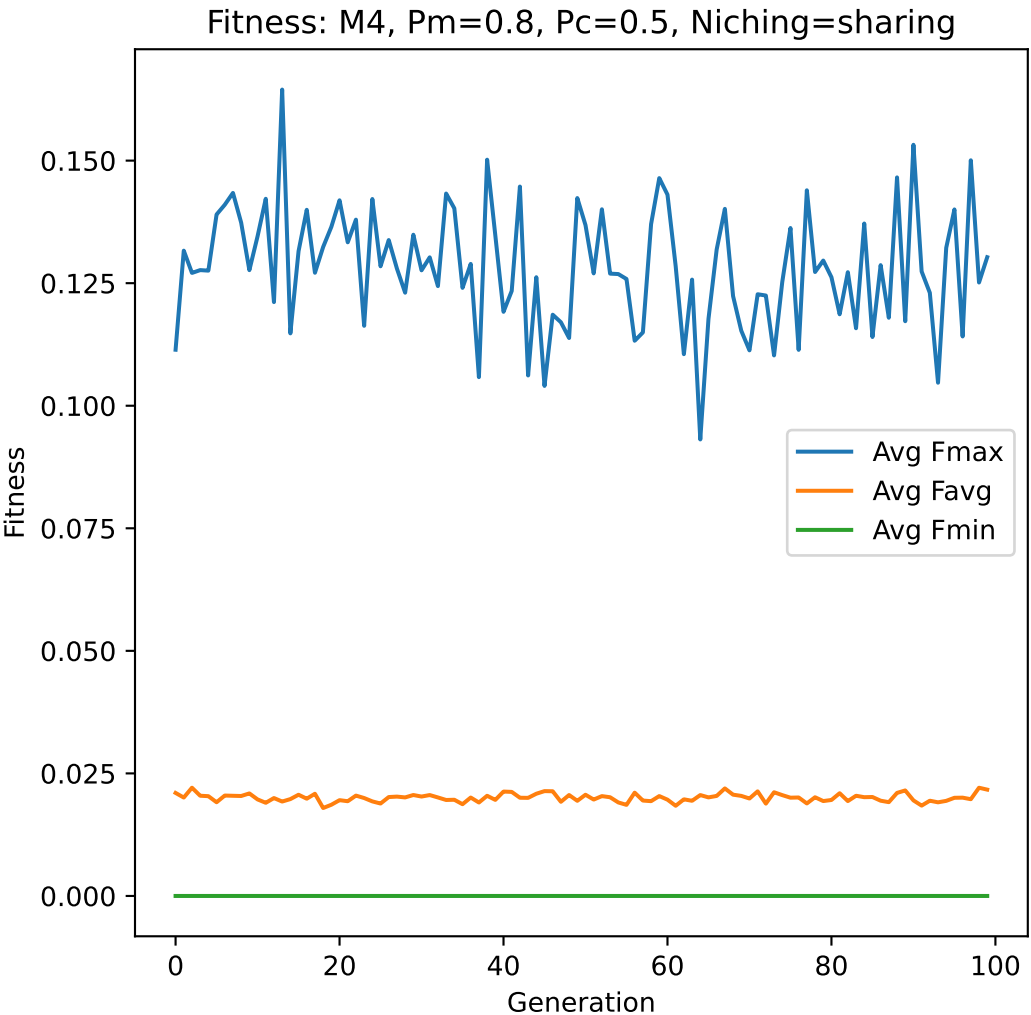

Landscape: M4, Pm=0.5, Pc=0.5, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

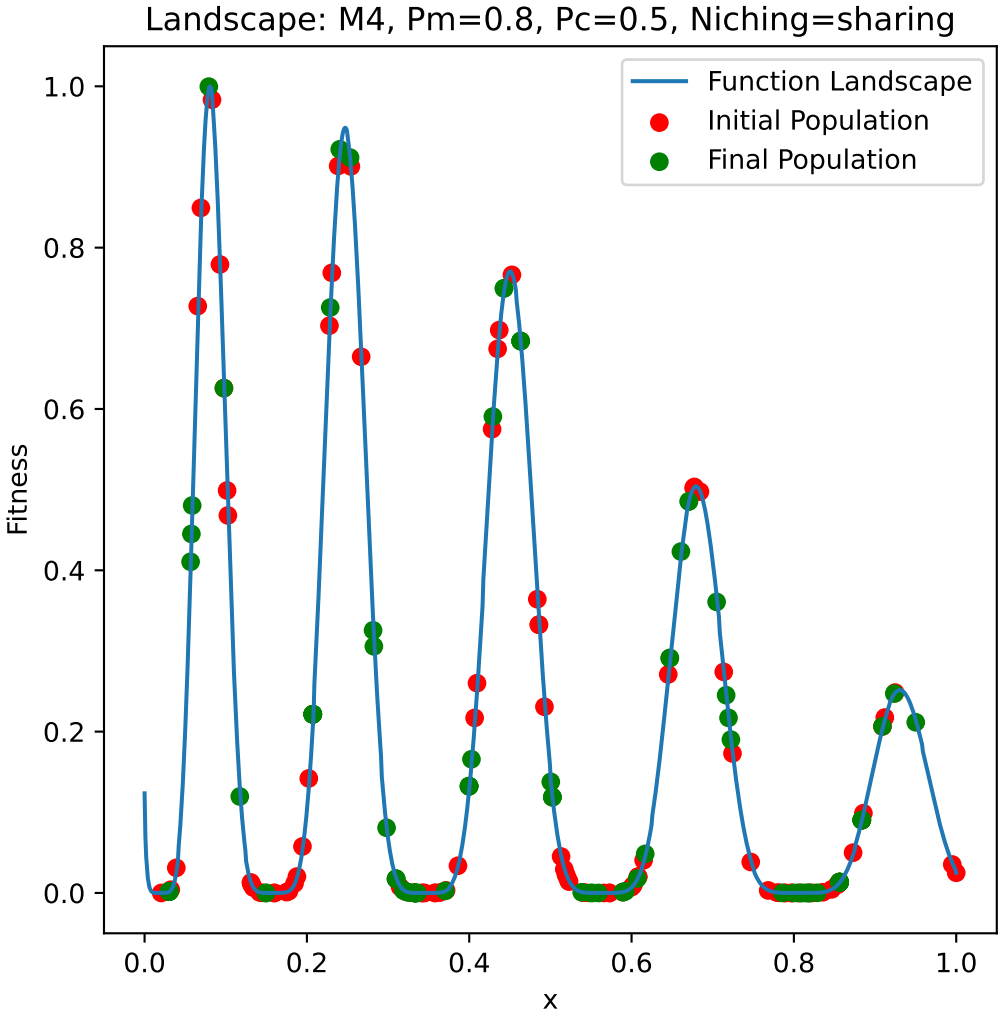

Fitness: M4, Pm=0.5, Pc=0.8, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
0
20
40
60
80
100
Generation

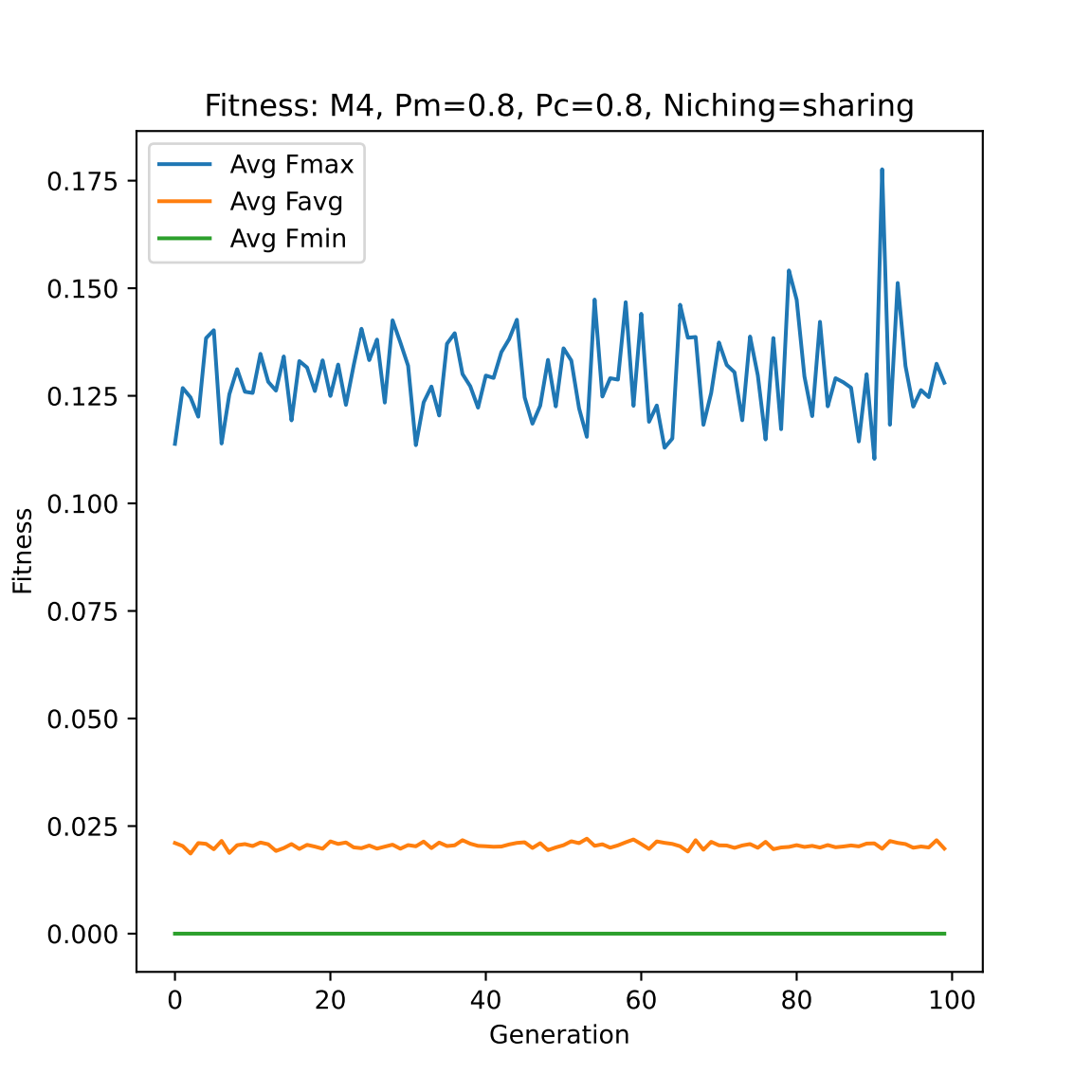

Landscape: M4, Pm=0.5, Pc=0.8, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

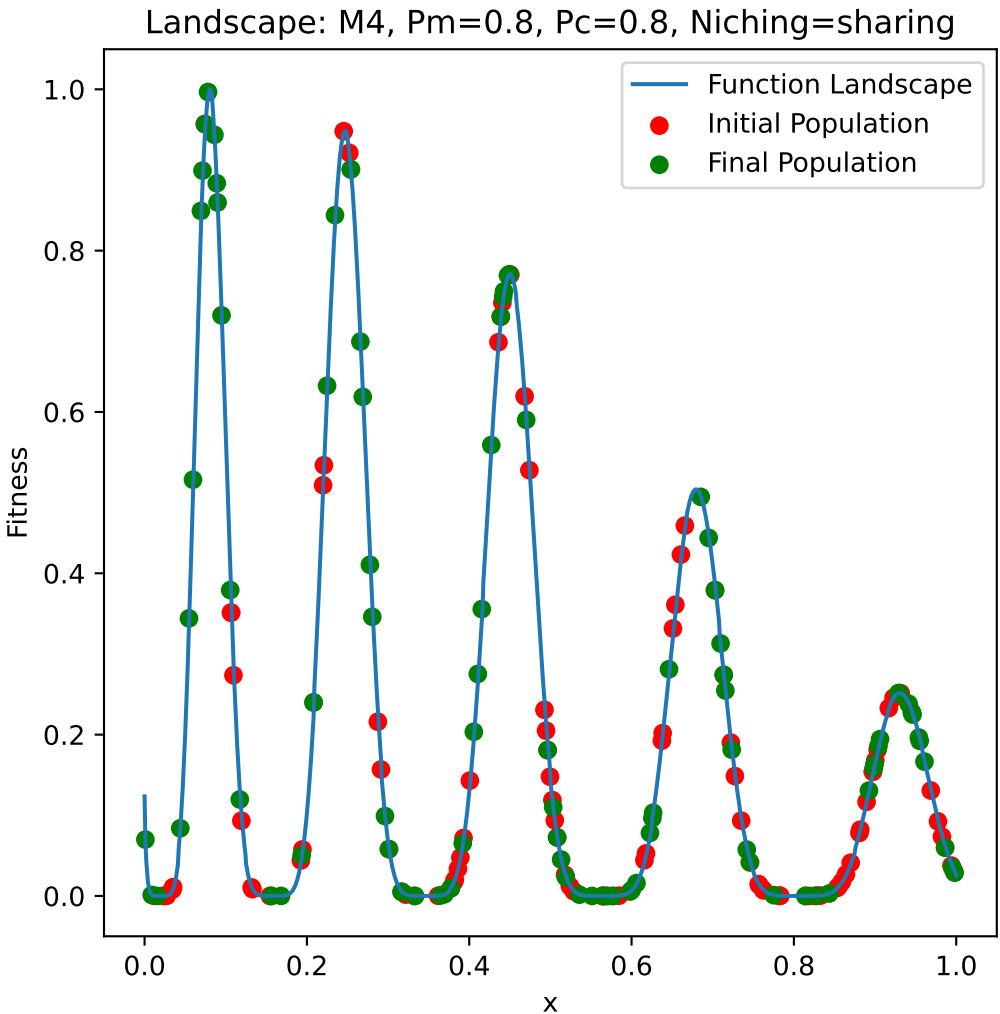

Fitness: M4, Pm=0.8, Pc=0.2, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
Fitness
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
Generation

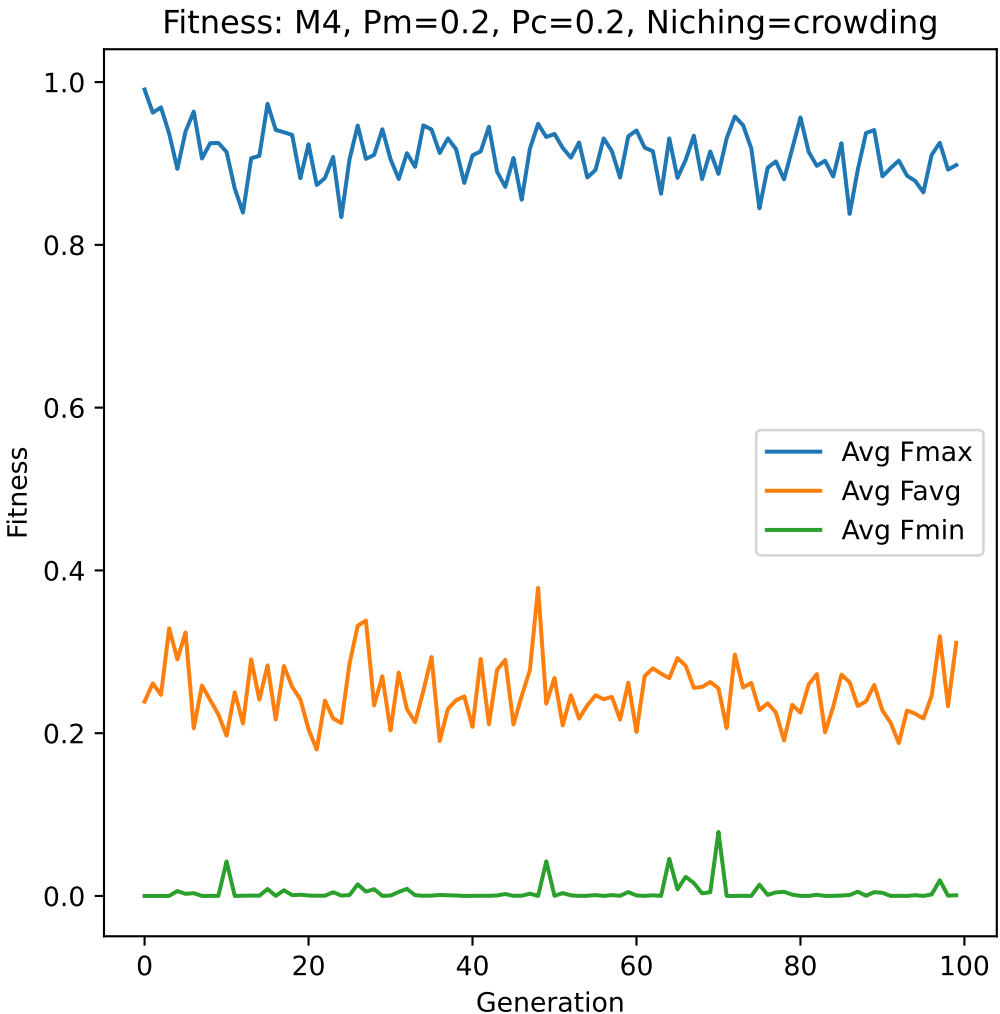

Landscape: M4, Pm=0.8, Pc=0.2, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

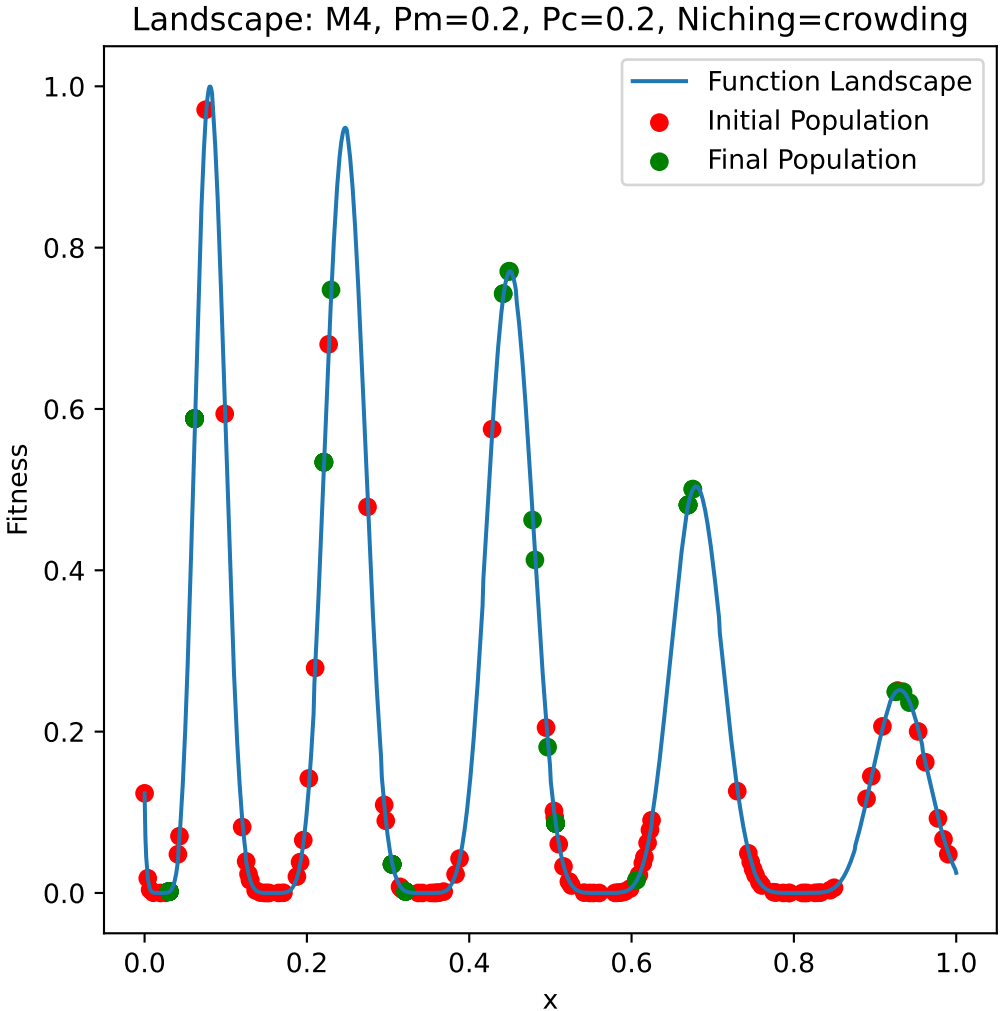

Fitness: M4, Pm=0.8, Pc=0.5, Niching=sharing
Fitness
Generation
Avg Fmax
Avg Favg
Avg Fmin
0.150
0.125
0.100
0.075
0.050
0.025
0.000
0
20
40
60
80
100

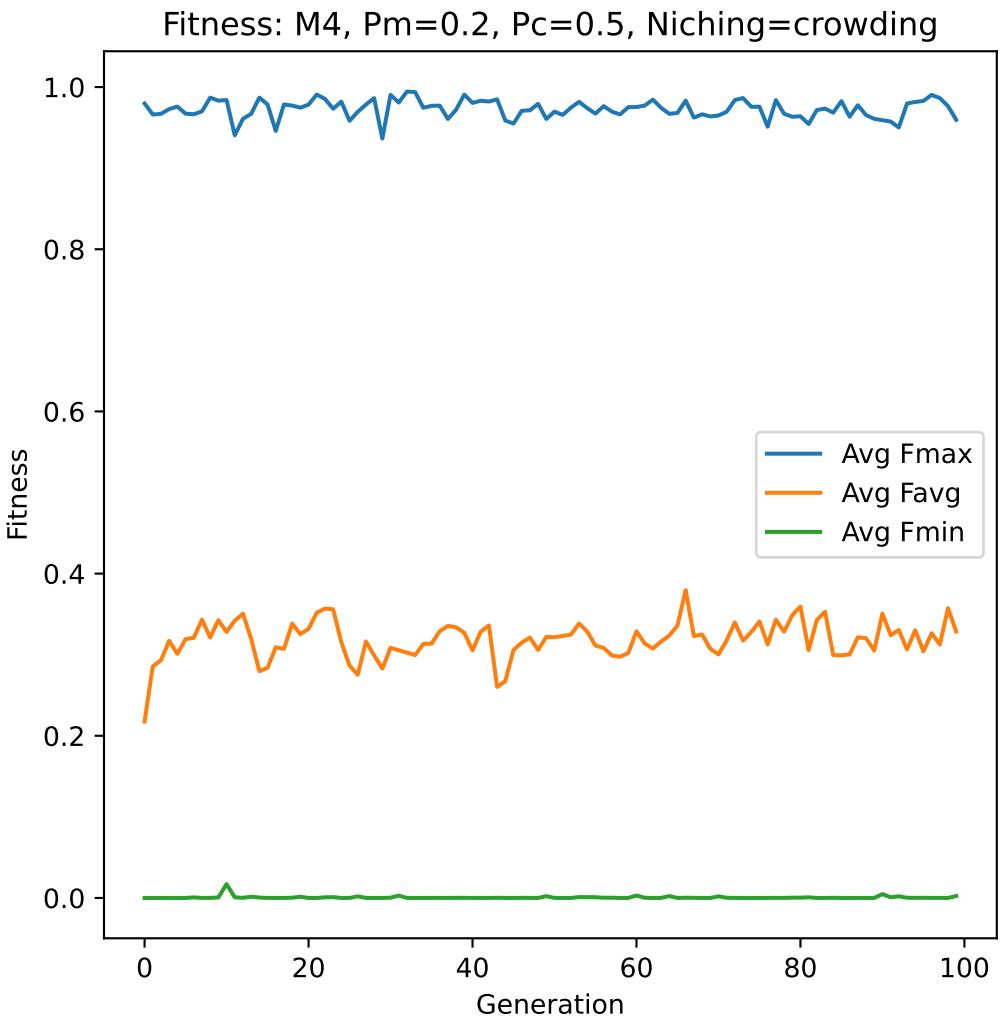

Landscape: M4, Pm=0.8, Pc=0.5, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

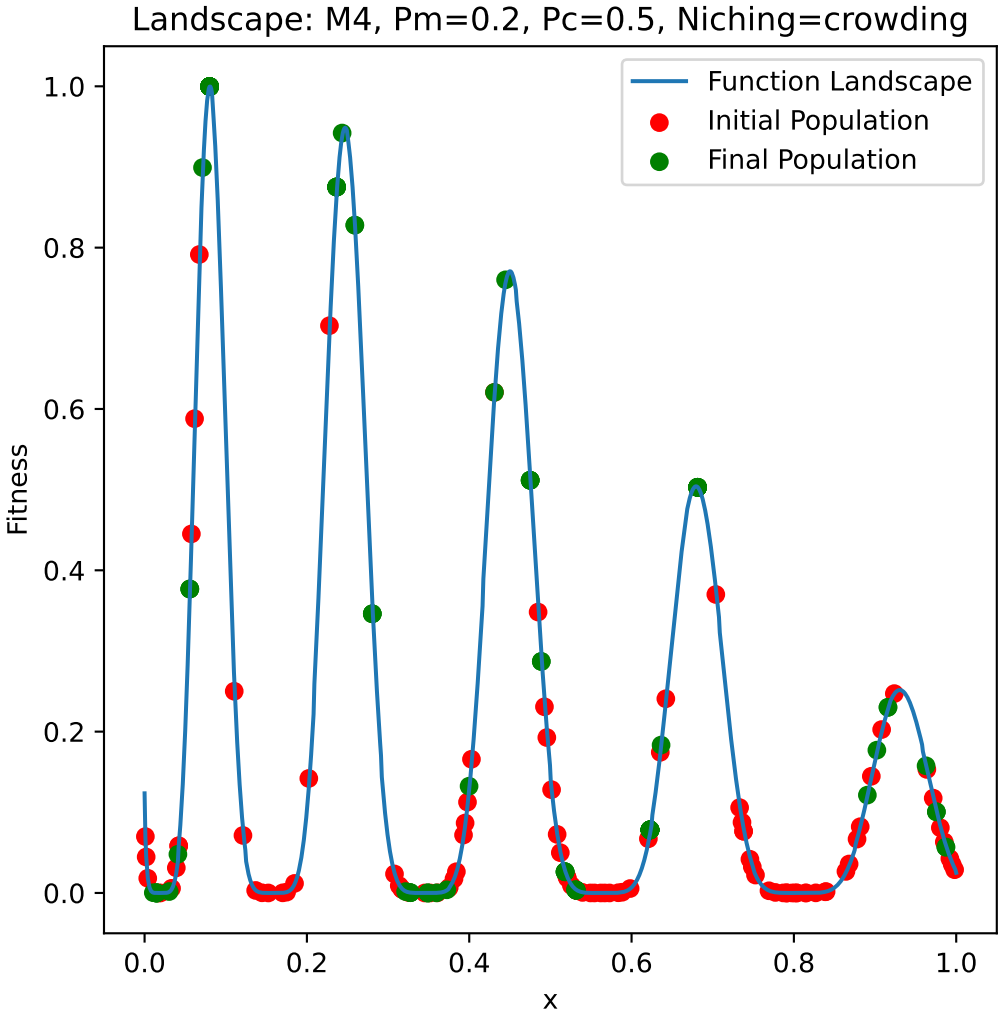

Fitness: M4, Pm=0.8, Pc=0.8, Niching=sharing
Avg Fmax
Avg Favg
Avg Fmin
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Fitness
0
20
40
60
80
100
Generation

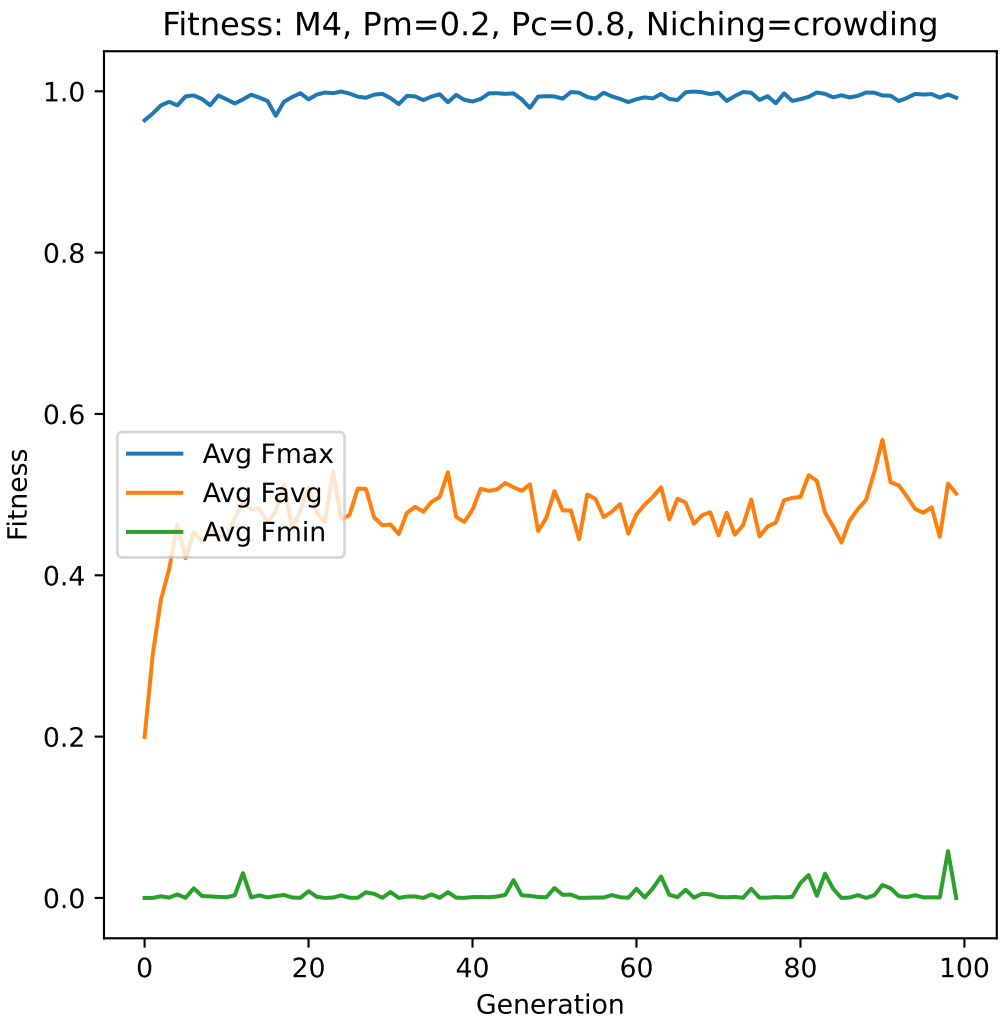

Landscape: M4, Pm=0.8, Pc=0.8, Niching=sharing
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

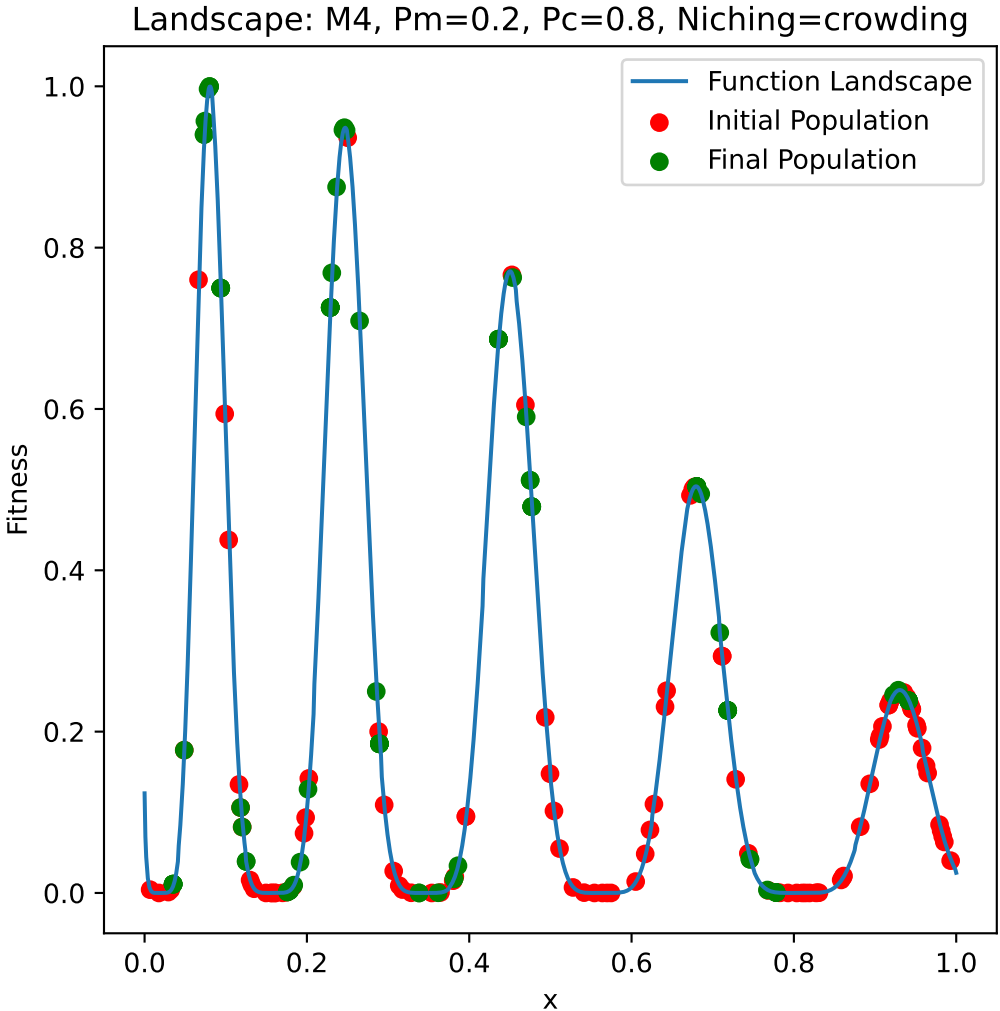

Fitness: M4, Pm=0.2, Pc=0.2, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

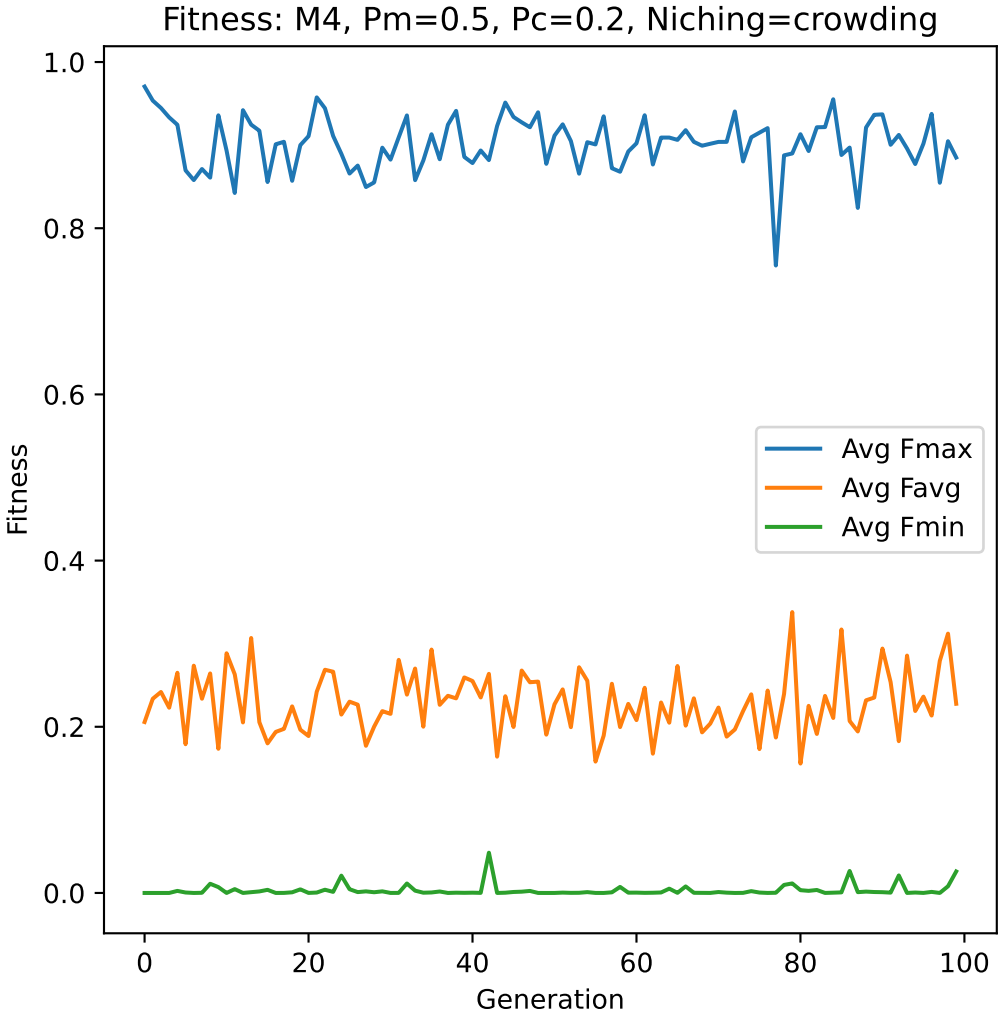

Landscape: M4, Pm=0.2, Pc=0.2, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

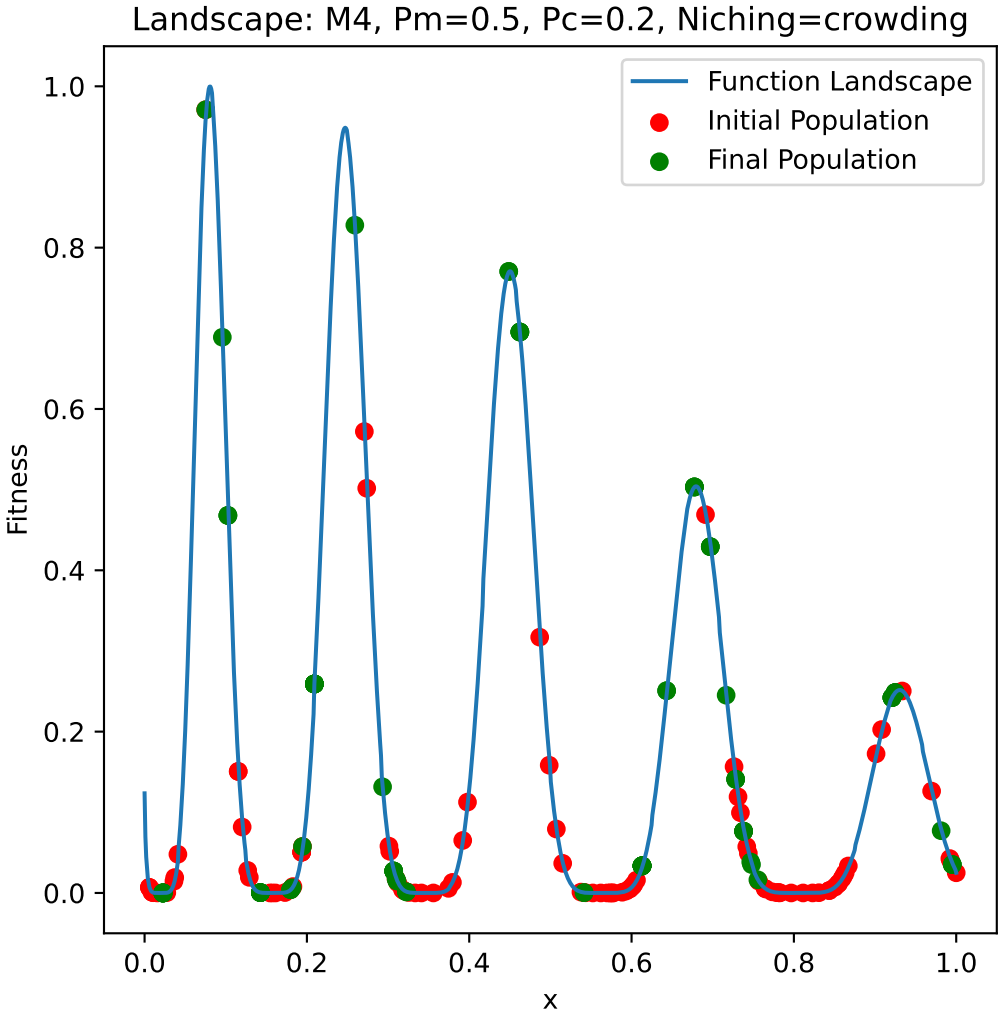

Fitness: M4, Pm=0.2, Pc=0.5, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

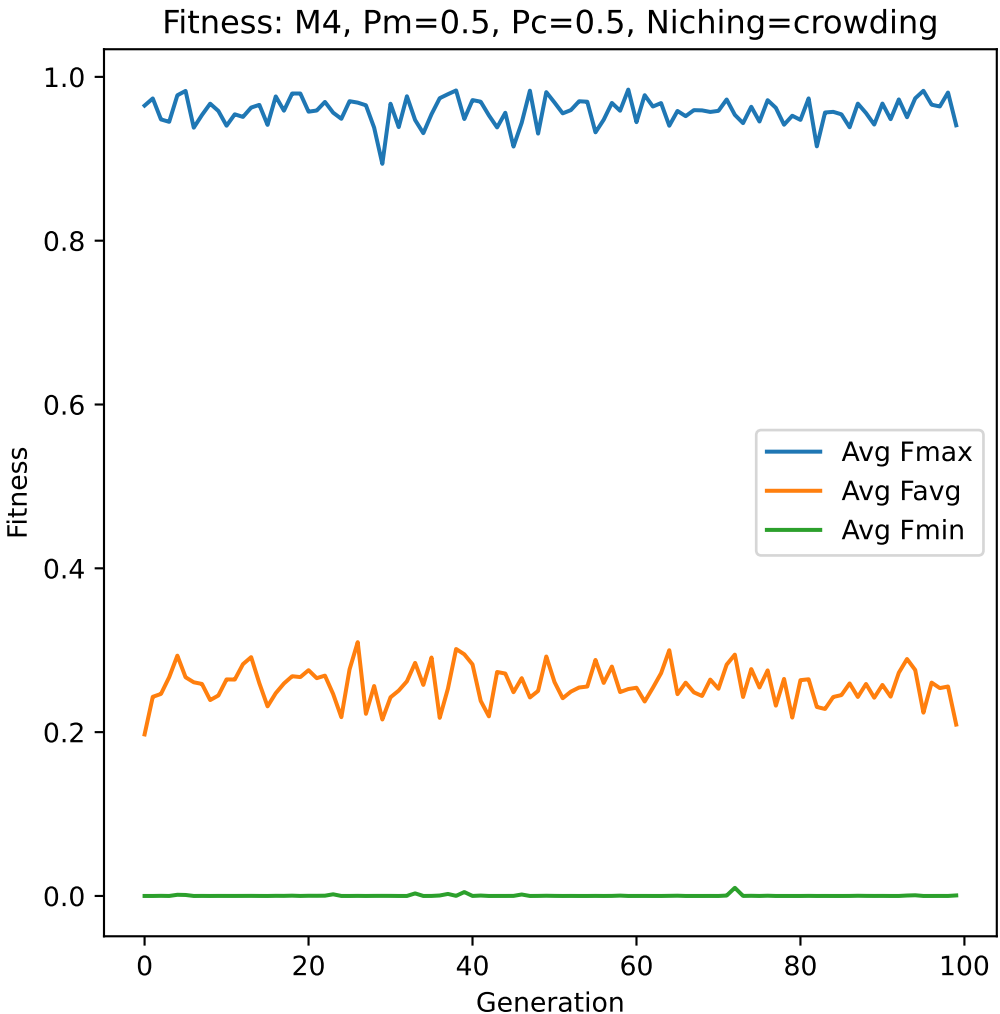

Landscape: M4, Pm=0.2, Pc=0.5, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

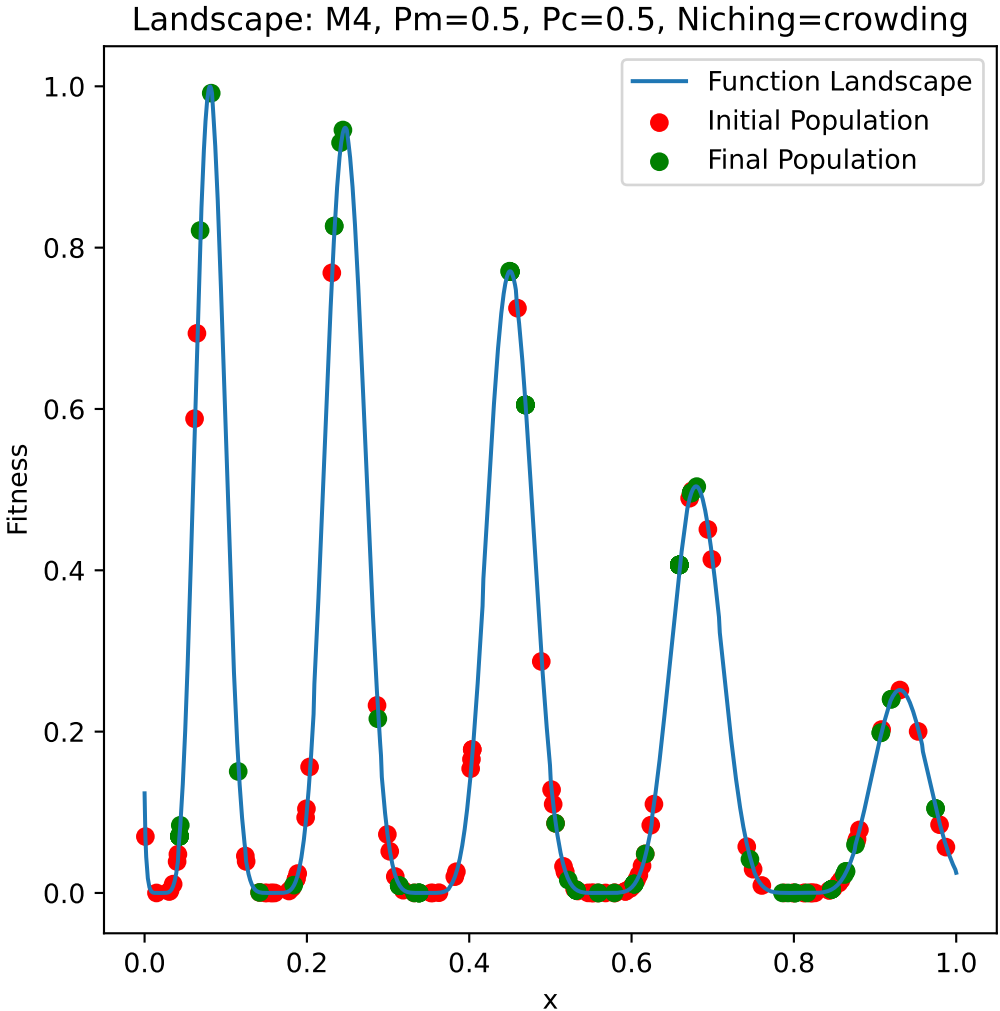

Fitness: M4, Pm=0.2, Pc=0.8, Niching=crowding
Avg Fmax
Avg Favg
Avg Fmin
Fitness
Generation
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100

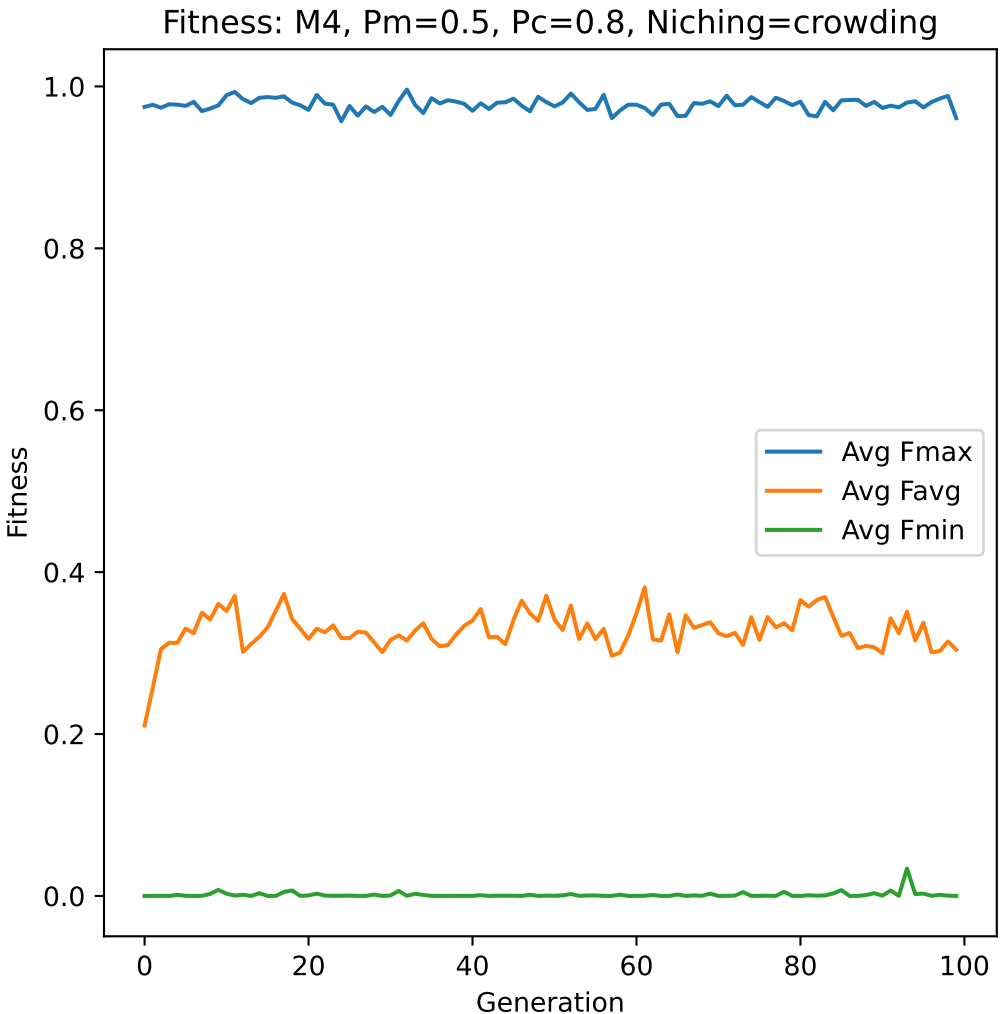

Landscape: M4, Pm=0.2, Pc=0.8, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0

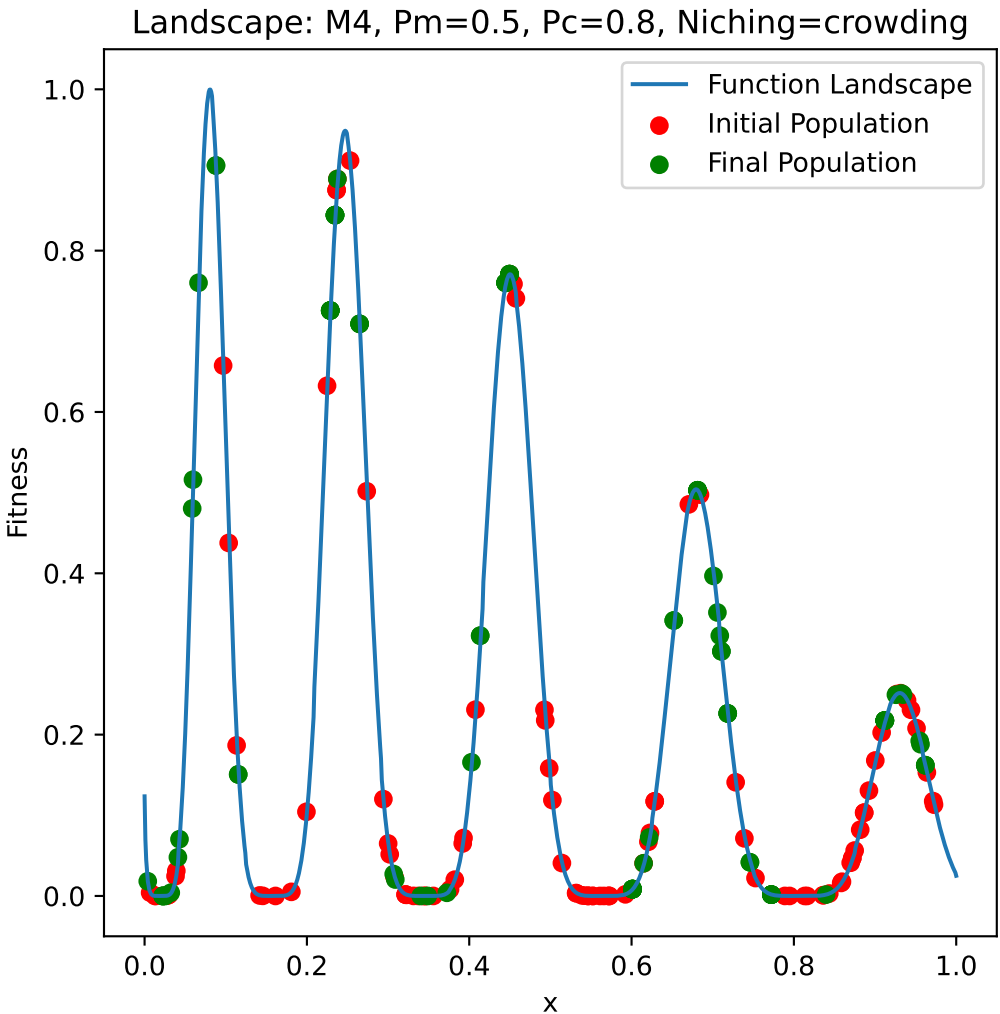

Fitness: M4, Pm=0.5, Pc=0.2, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin

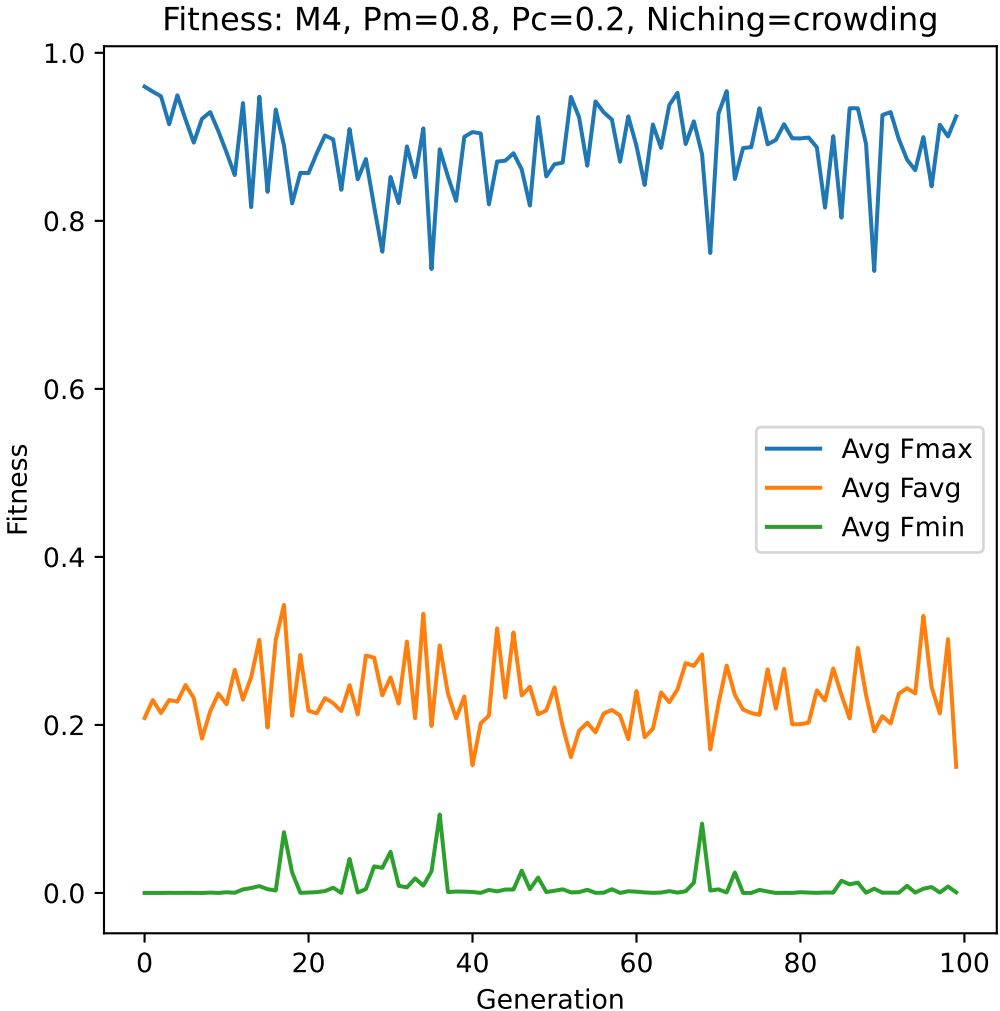

Landscape: M4, Pm=0.5, Pc=0.2, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M4, Pm=0.5, Pc=0.5, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M4, Pm=0.5, Pc=0.5, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M4, Pm=0.5, Pc=0.8, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M4, Pm=0.5, Pc=0.8, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M4, Pm=0.8, Pc=0.2, Niching=crowding
1.0
0.8
0.6
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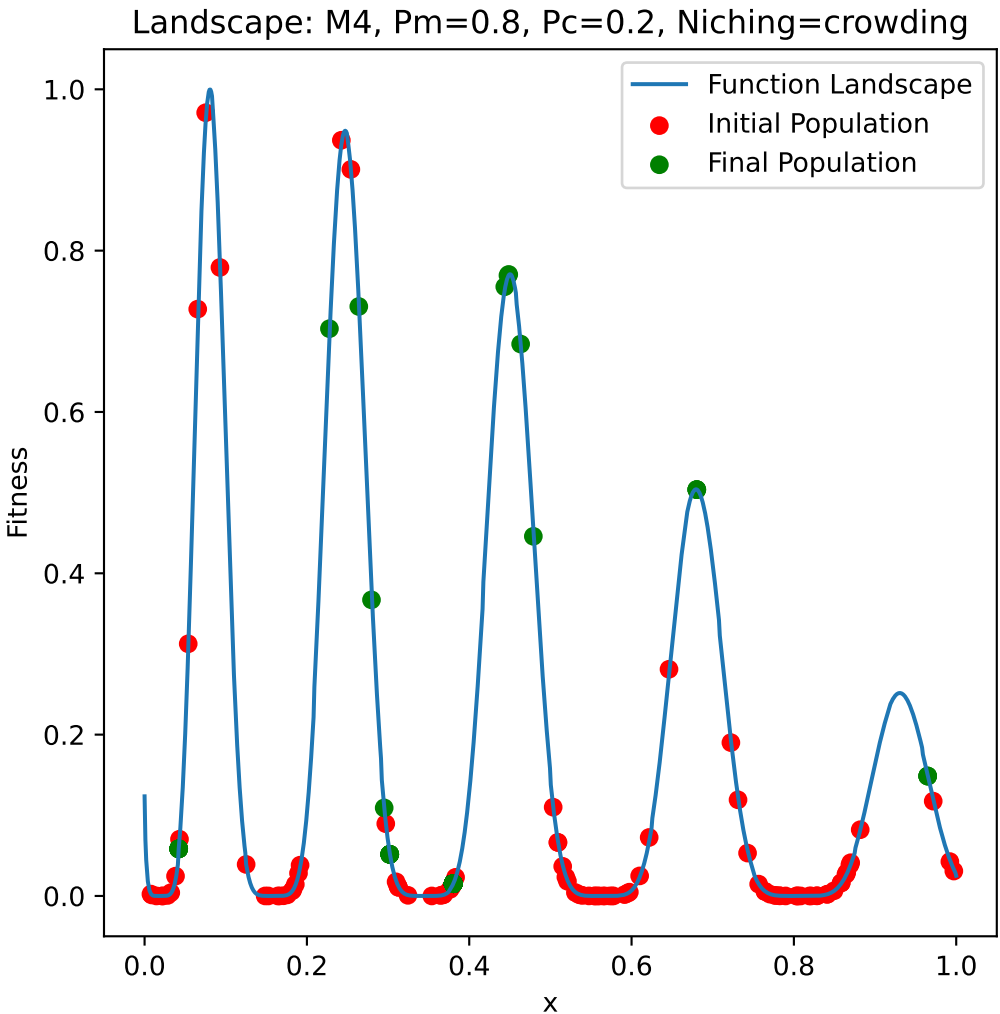
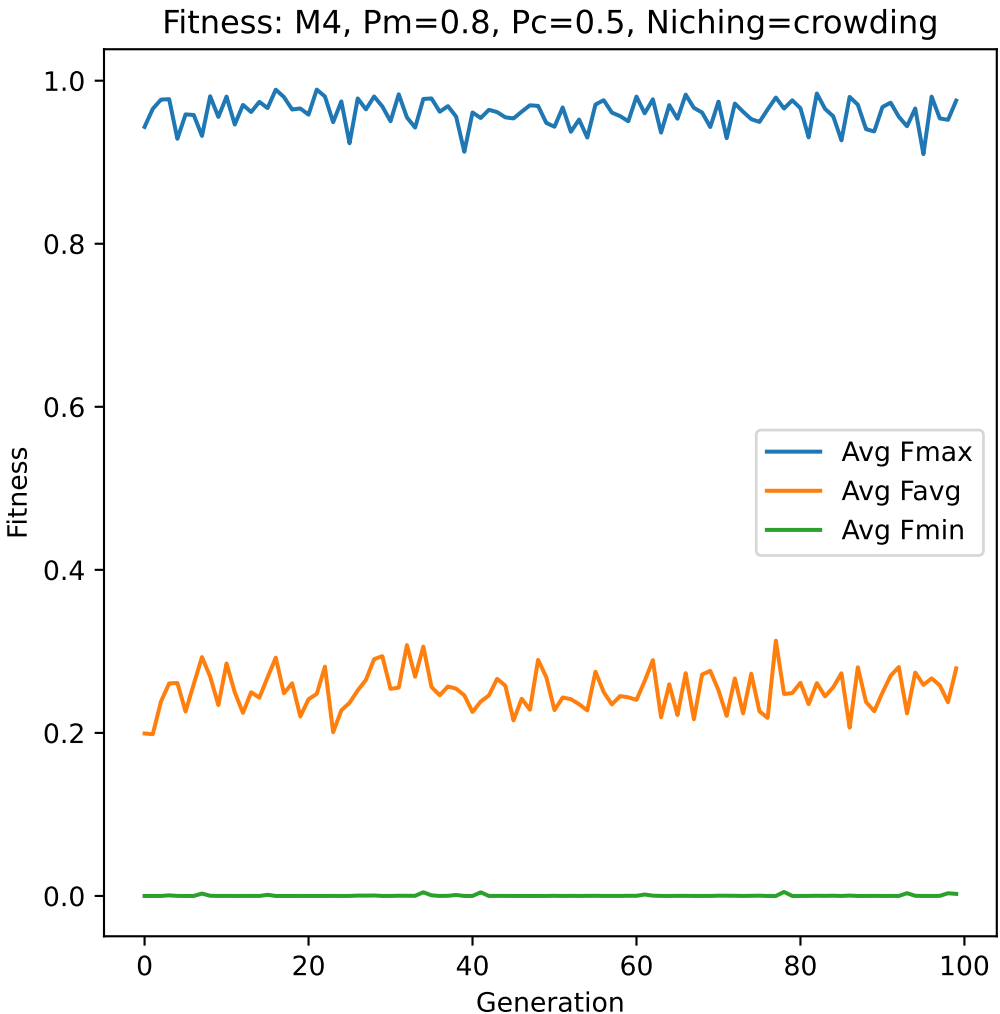
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M4, Pm=0.8, Pc=0.2, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M4, Pm=0.8, Pc=0.5, Niching=crowding
1.0
0.8
0.6
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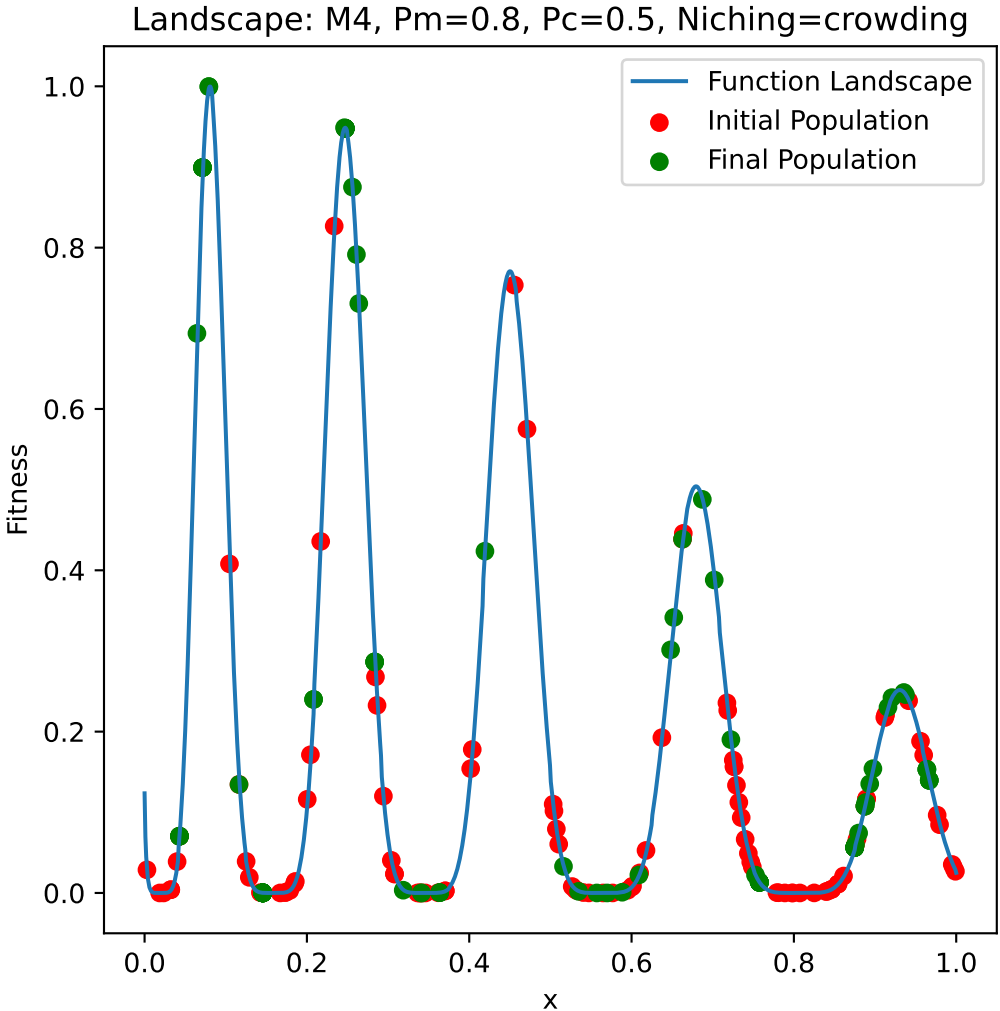
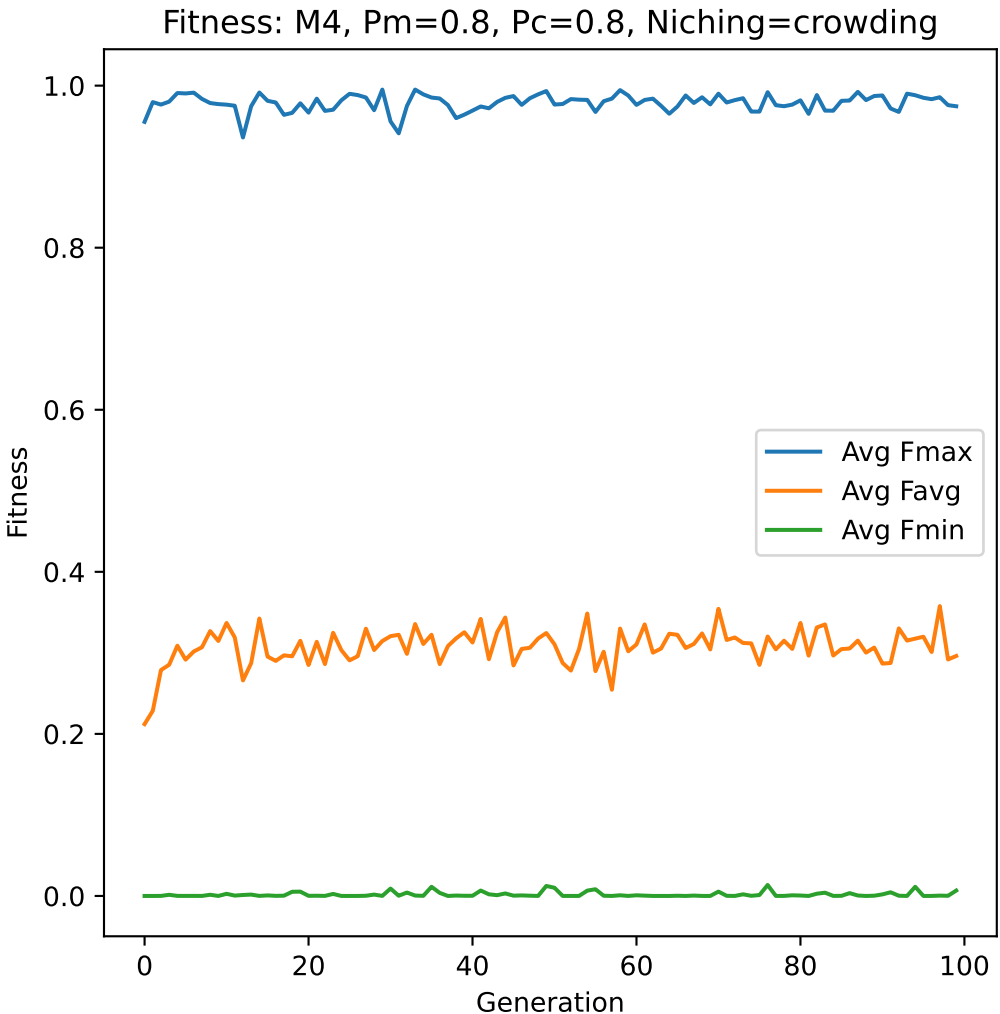
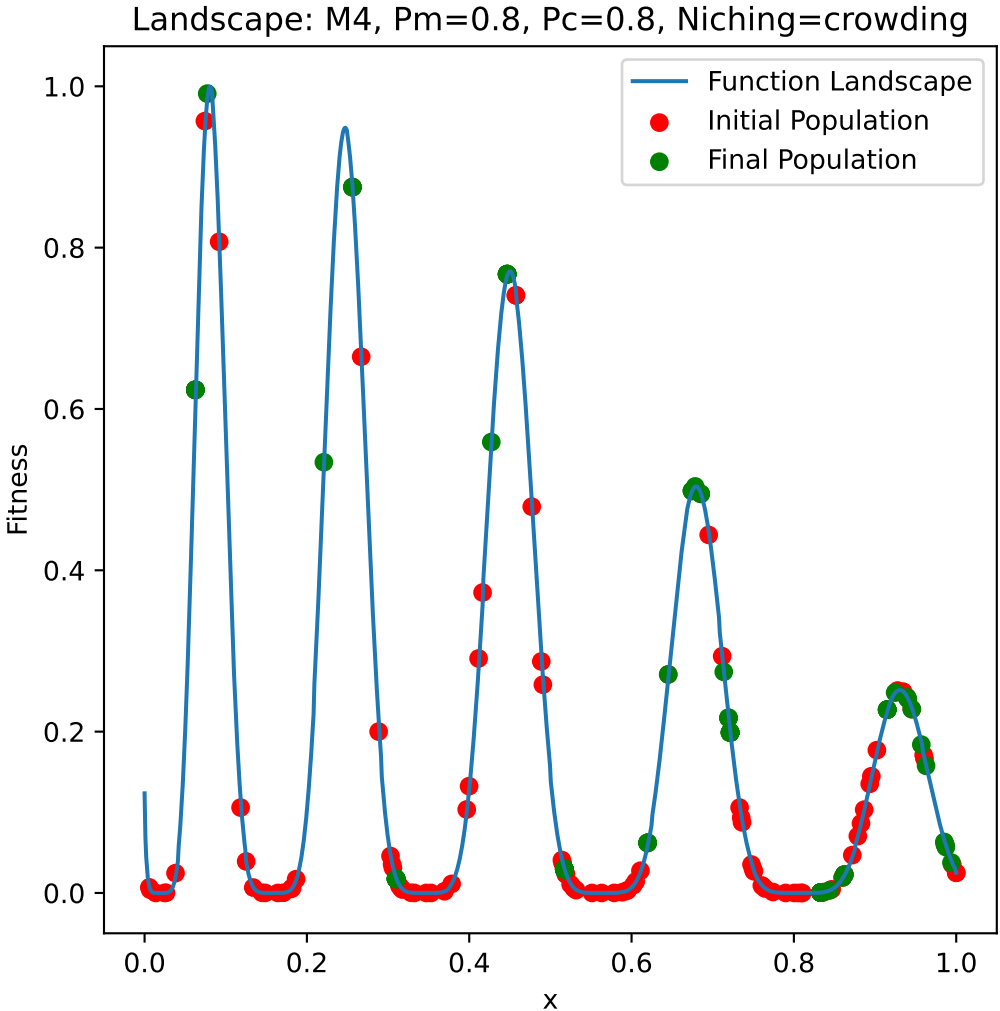
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M4, Pm=0.8, Pc=0.5, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0


Fitness: M4, Pm=0.8, Pc=0.8, Niching=crowding
1.0
0.8
0.6
0.4
0.2
0.0
Fitness
0
20
40
60
80
100
Generation
Avg Fmax
Avg Favg
Avg Fmin


Landscape: M4, Pm=0.8, Pc=0.8, Niching=crowding
Function Landscape
Initial Population
Final Population
Fitness
x
0.0
0.2
0.4
0.6
0.8
1.0