Effect of Test Functions on Optimization

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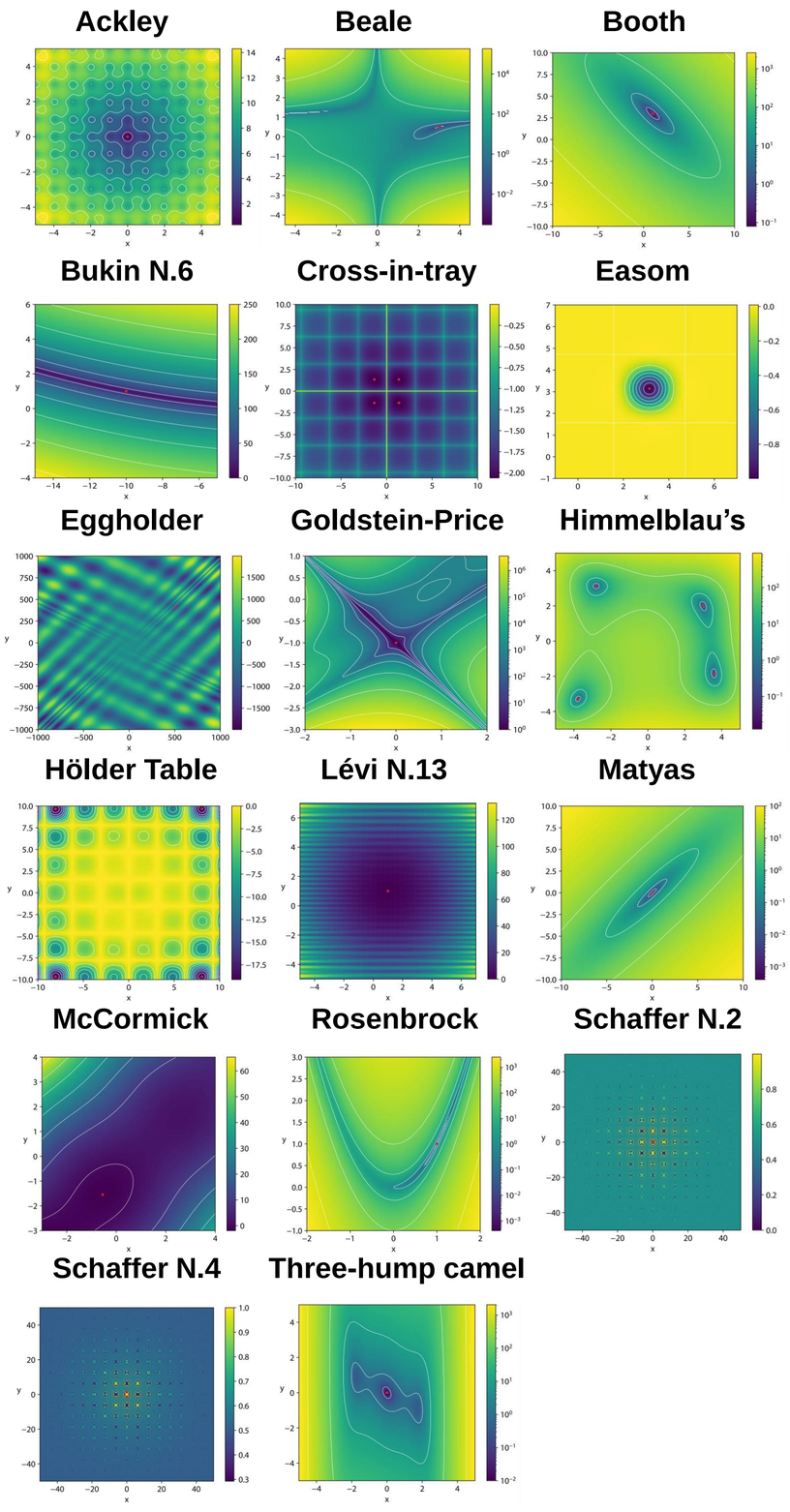
Introduction

- **Determine the effect of optimization functions**
- **Using Evolutionary Algorithms and Particle Swarms**

Motivation

- **These test functions can be used in multiple bio-inspired algorithms**
- **Can be used to determine effectiveness of algorithms**

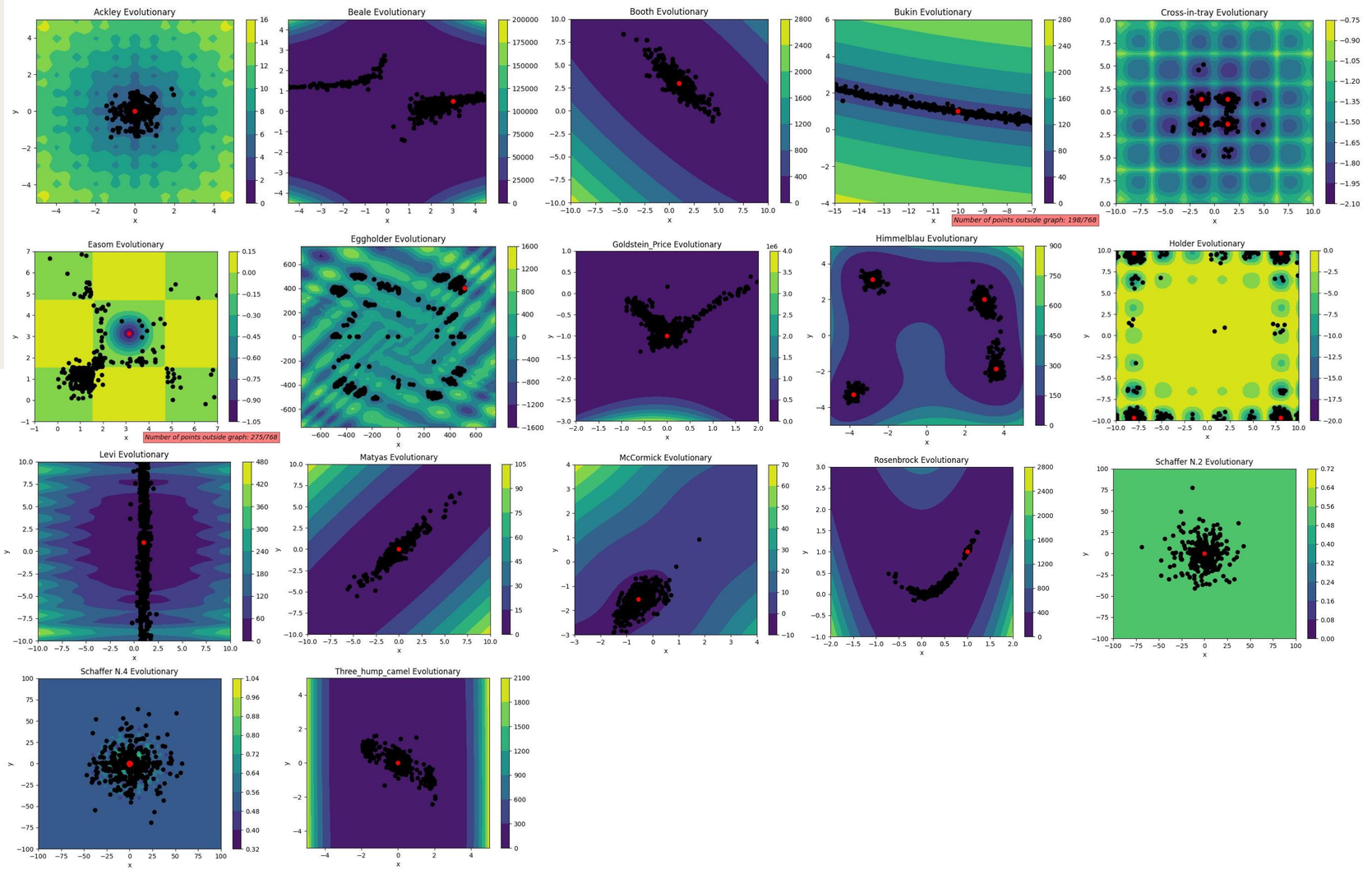
Approach



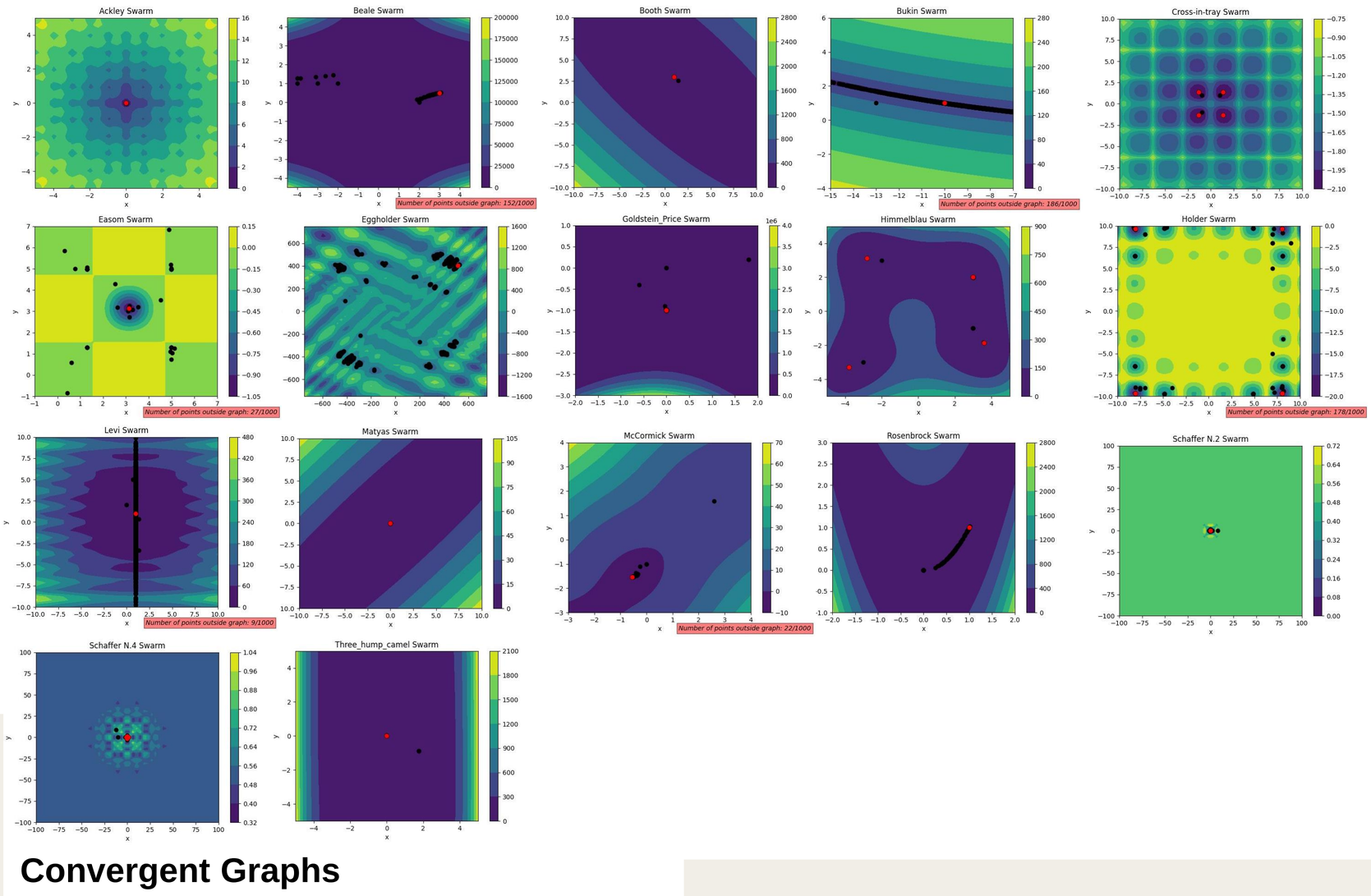
- **Evolutionary Algorithm**
  - **768 Tests Varying Parameters**
    - **Population Size**
    - **Mutation Probability**
    - **Probability of Uniform Crossover**
    - **Tournament Size**
- **Particle Swarm**
  - **1000 Tests Varying Parameters**
    - **Number of Particles**
    - **Inertia**
    - **Cognition**
    - **Social**

Results

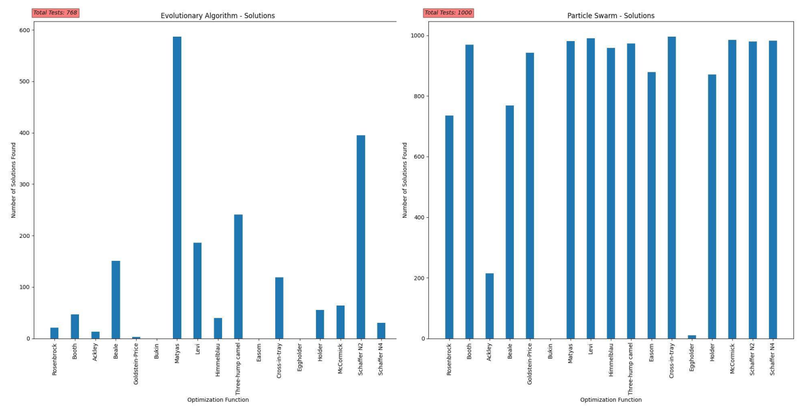
Evolutionary Algorithm



Particle Swarm



Convergent Graphs



Conclusion

- **Test functions that have large empty or dense spots have harder time converging**
- **Evolutionary algorithm not as efficient in this testing as particle swarm**
- **Varying parameters for each function effects results more than most functions**

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