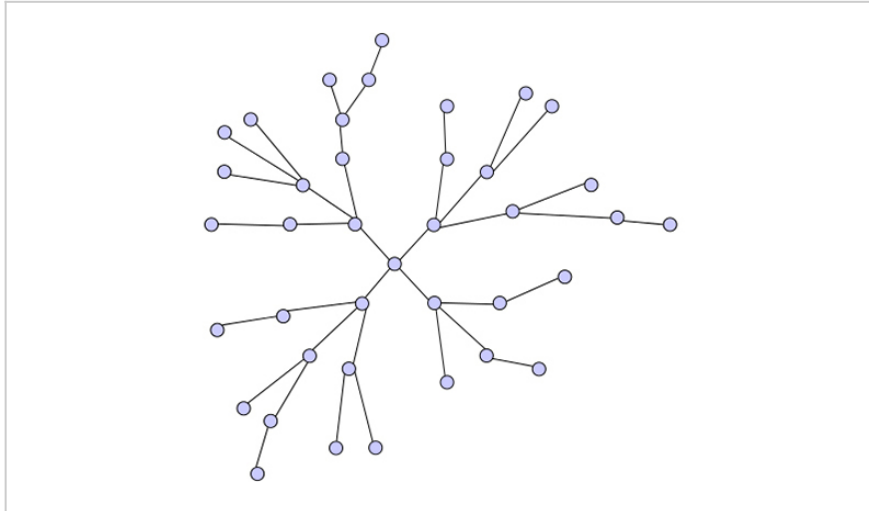


# Auto-adaptive MOEA with Higher Probability Results

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Networks are optimized by MOEAs

## Technology Summary

Conventional optimization algorithms using linear and non-linear programming sometimes have difficulty in finding the global optima or in case of multi-objective optimization, the pareto front. A lot of research has now been directed towards evolutionary algorithms to solve multi objective optimization problems.

In this disclosed invention, the "BORG" framework has been developed to overcome the failure modes for multiobjective evolutionary algorithms (MOEAs) for severely challenging problems. Such failure modes include dominance resistance and deterioration. Borg features an E-dominance archive with auto-adaptive operators that detect search stagnation, exploit randomized restarts to escape local optima, and select recombination operators based on their success in generating high quality solutions.

## Application & Market Utility

"BORG" reliably and consistently produces Pareto sets matching or exceeding the best-known algorithms in terms of convergence and diversity. "BORG" showed significant advantages over competing algorithms (MOEA/D, GDE3, OMOPSO) on many-objective, multimodal problems. On such problems, not only did "BORG" produce results with significantly better hypervolume, and achieved such results with higher probability. BORG's auto adaptive mechanism strongly reduces parameterization challenges and retains a large "sweet spot," even on problems with many objectives.

Some applications for multi-objective optimization algorithms include process optimization in chemical engineering and manufacturing, radio resource management, finances/economics, power grid design, and many others.

## Next Steps

Regular patent 8,856,054 has issued. Currently seeking licensees.

TECHNOLOGY READINESS LEVEL

4-7

### Seeking

Licensing |

### Keywords

- multiobjective evolutionary algorithms
- dominance resistance
- auto-adaptive operators
- multimodal problems

### Researchers

#### Patrick Reed

Associate Professor of Civil and Environmental Engineering

[Online Bio](#)

[Website](#)

#### David Hadka

Graduate Student

### Originating College

College of Engineering

### Office of Technology Management Contact

Swope, Bradley  
bas101@psu.edu  
814-863-5987



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