Python Simulation Results Updated

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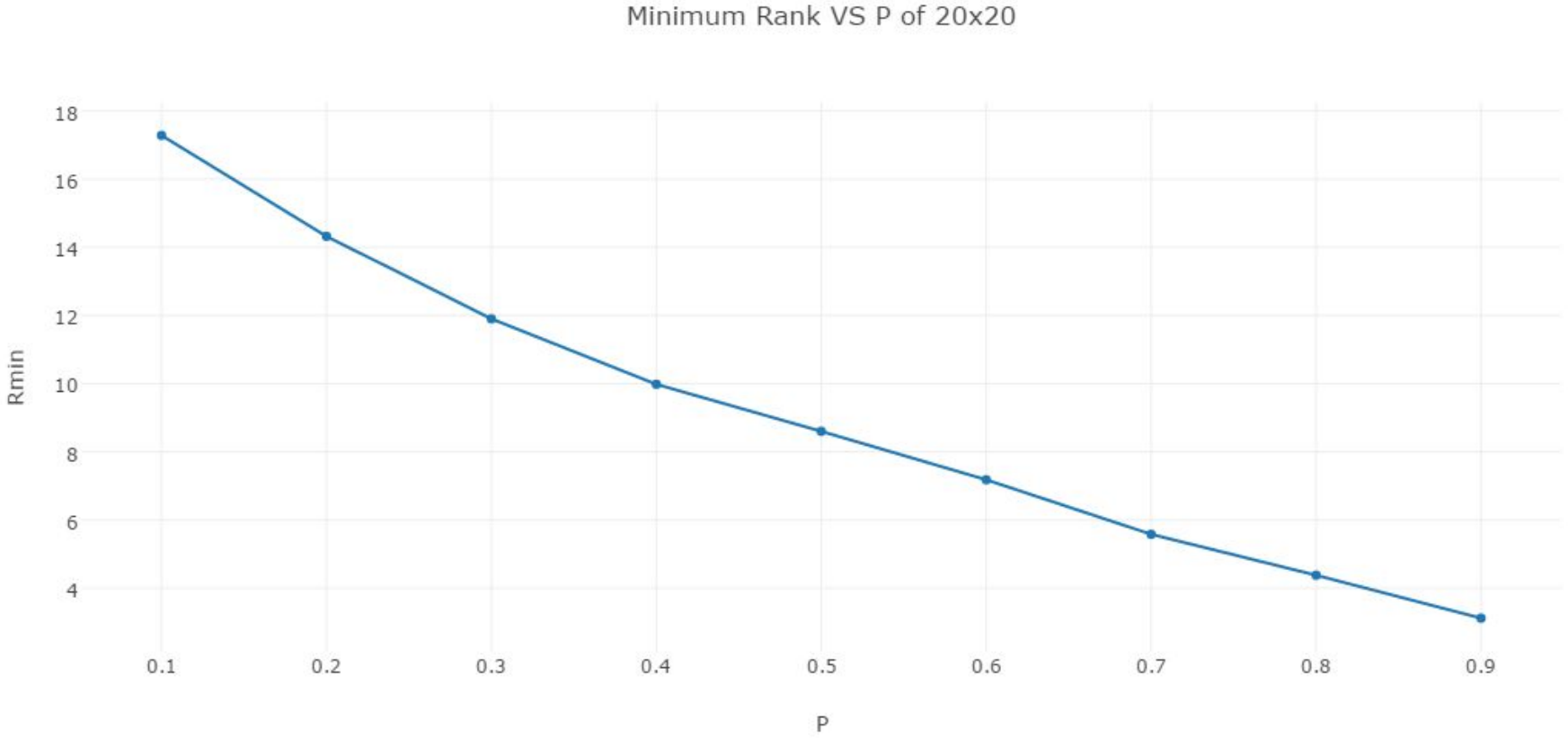
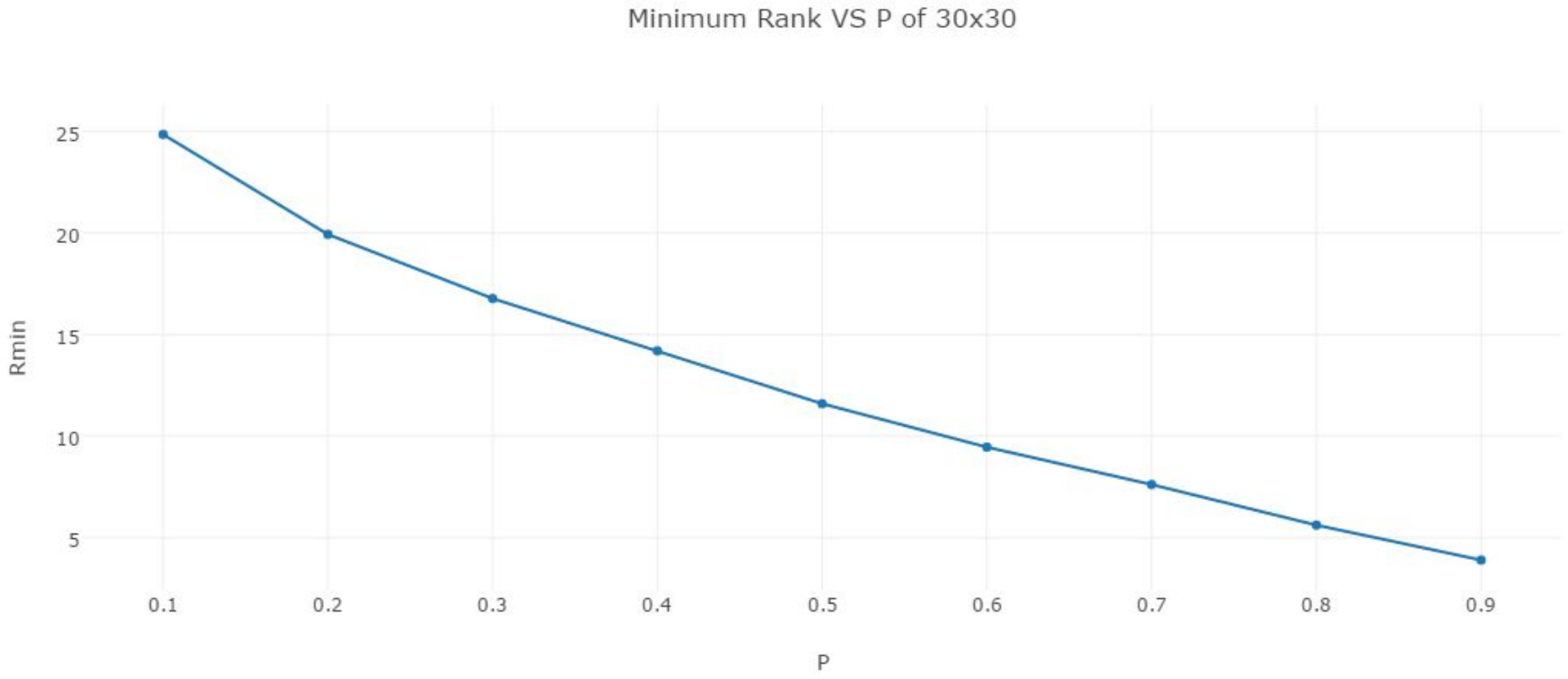
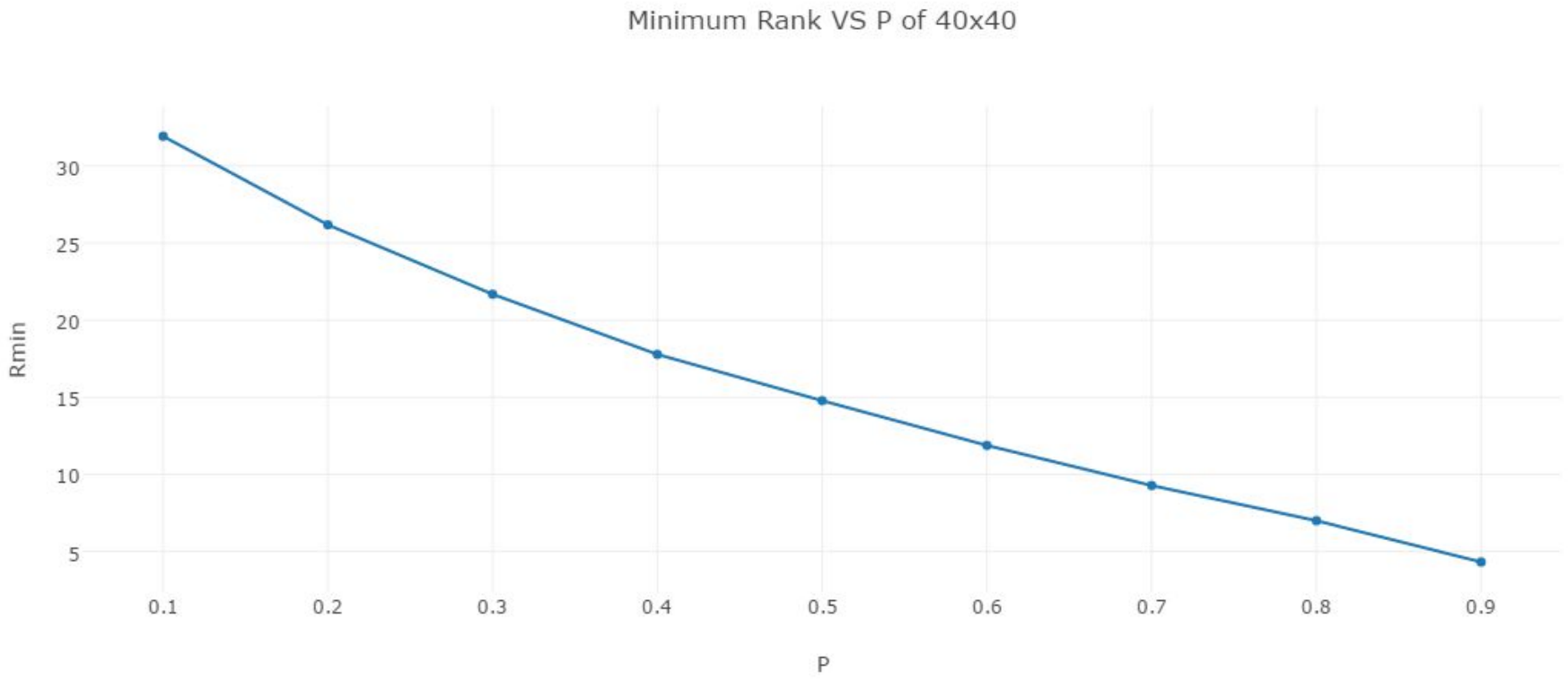
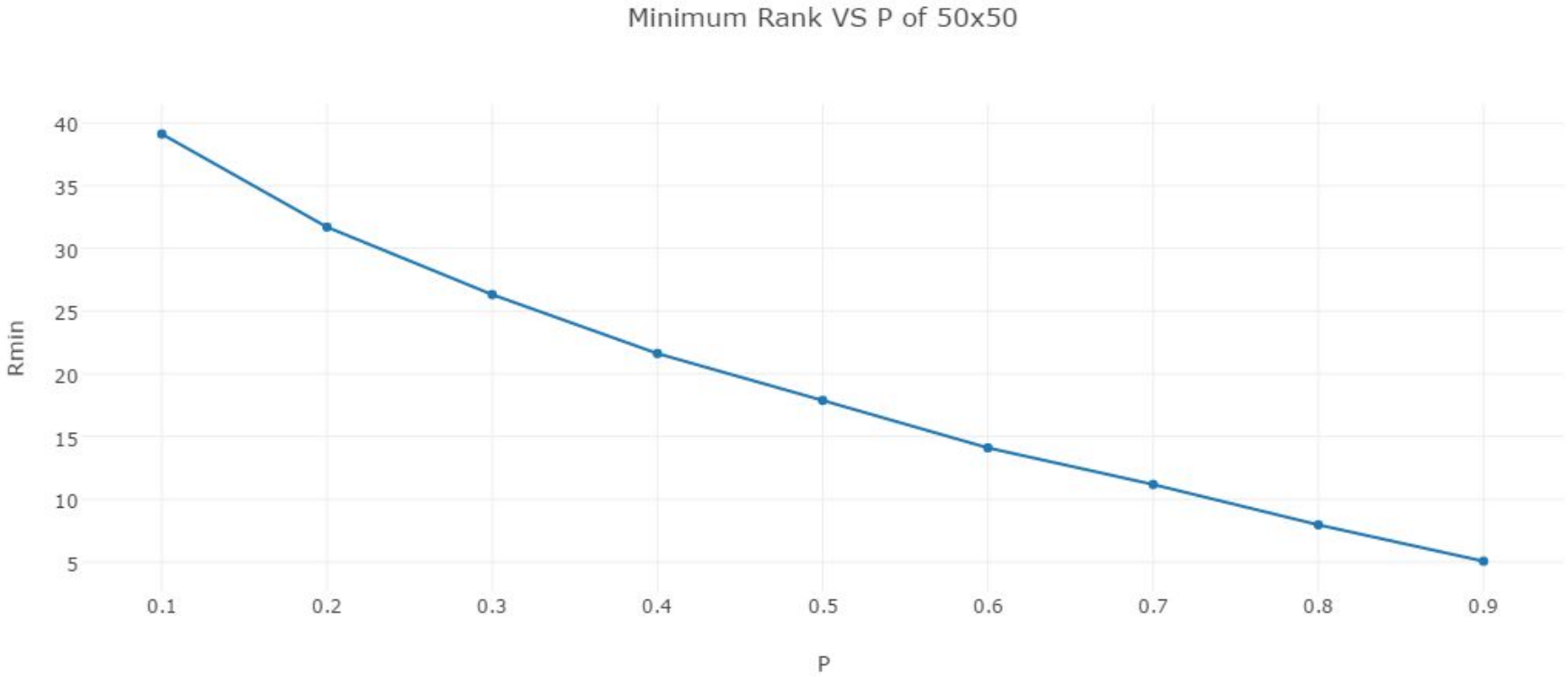
APIC algorithm flaw fixed

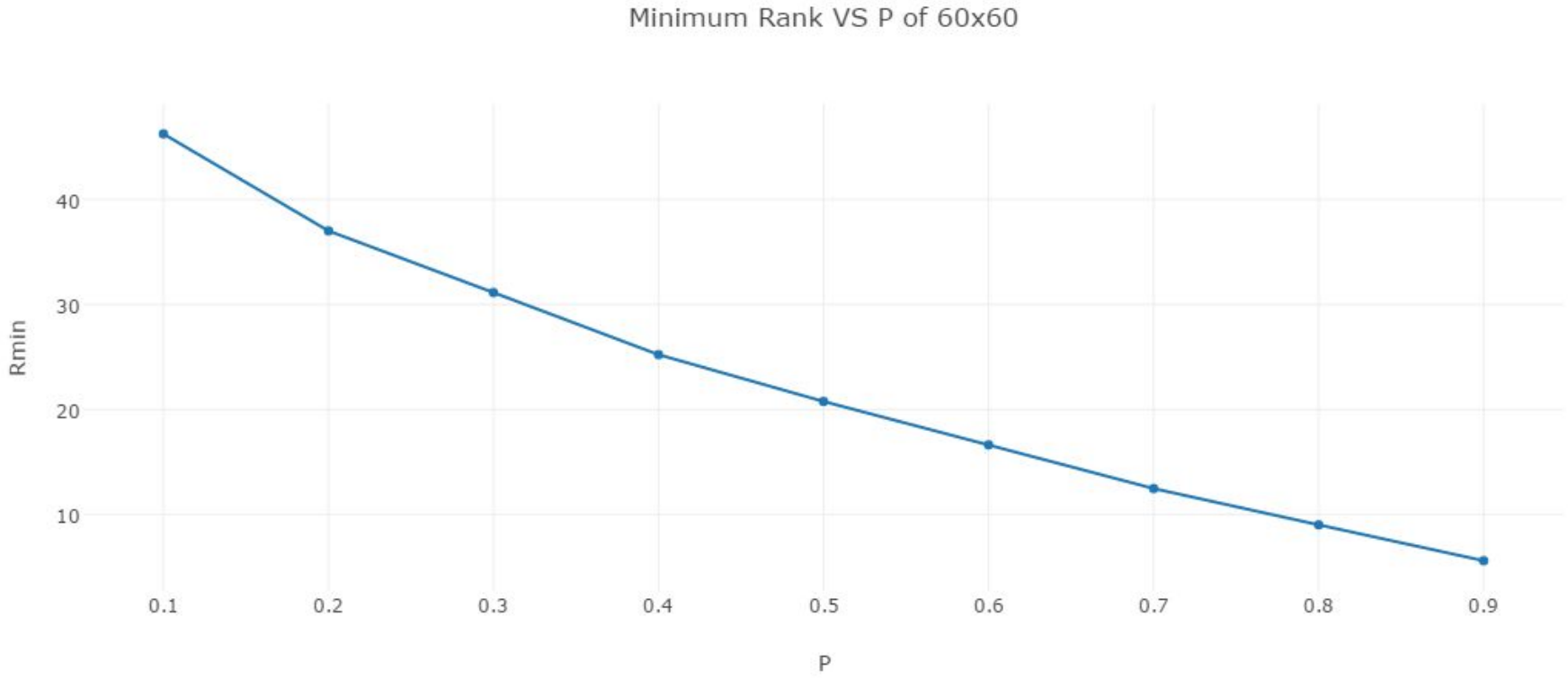
- Used older version of APIC code that changed a few lines in the code
- Can run 100x100 matrix and reduce Rmin
  - Have not tested on larger matrices
- All Rmin graphs for NxN sized matrices very similar
- The larger the matrix the longer it takes to run
- Single run time for a 100x100 matrix can take 10 minutes

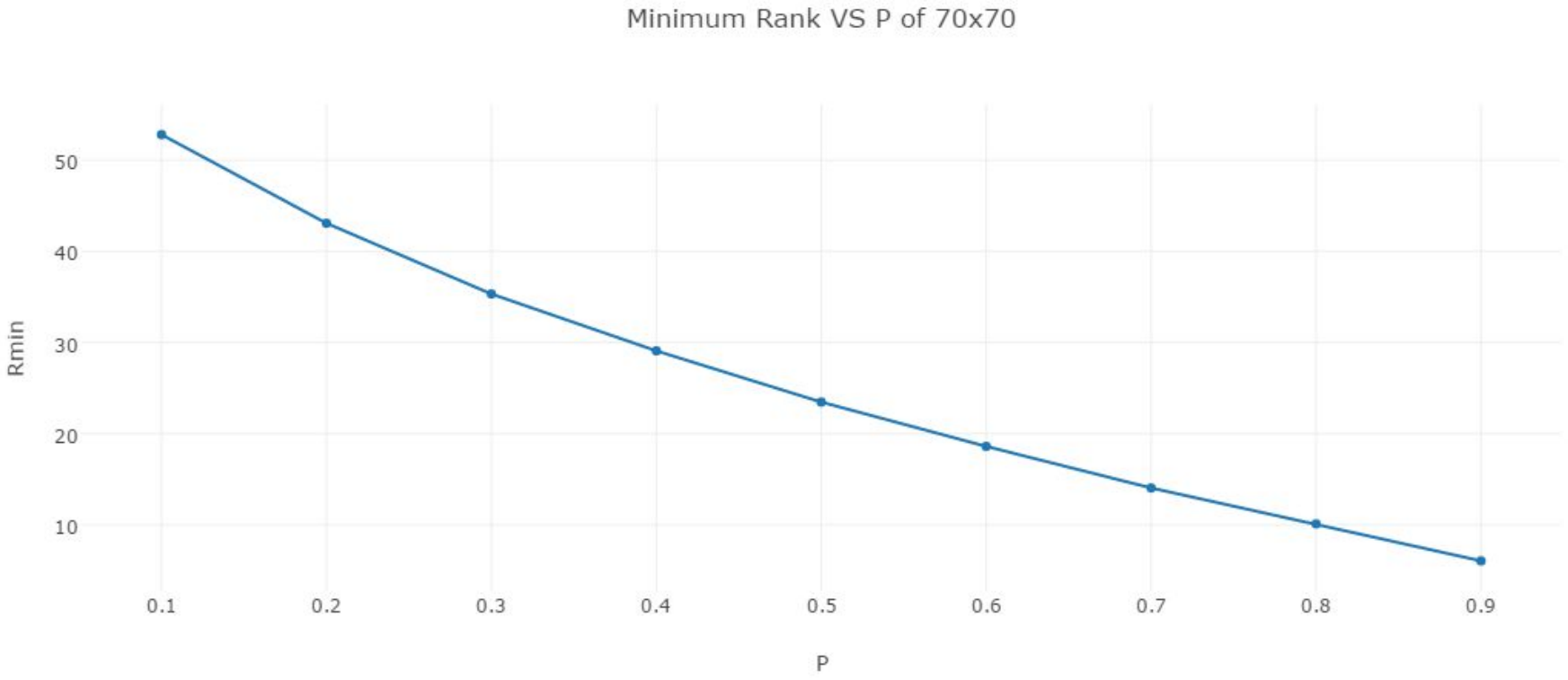

Minimum Rank VS P of 20x20
Rmin
18
16
14
12
10
8
6
4
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Minimum Rank VS P of 30x30
Rmin
25
20
15
10
5
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Minimum Rank VS P of 40x40
Rmin
30
25
20
15
10
5
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P

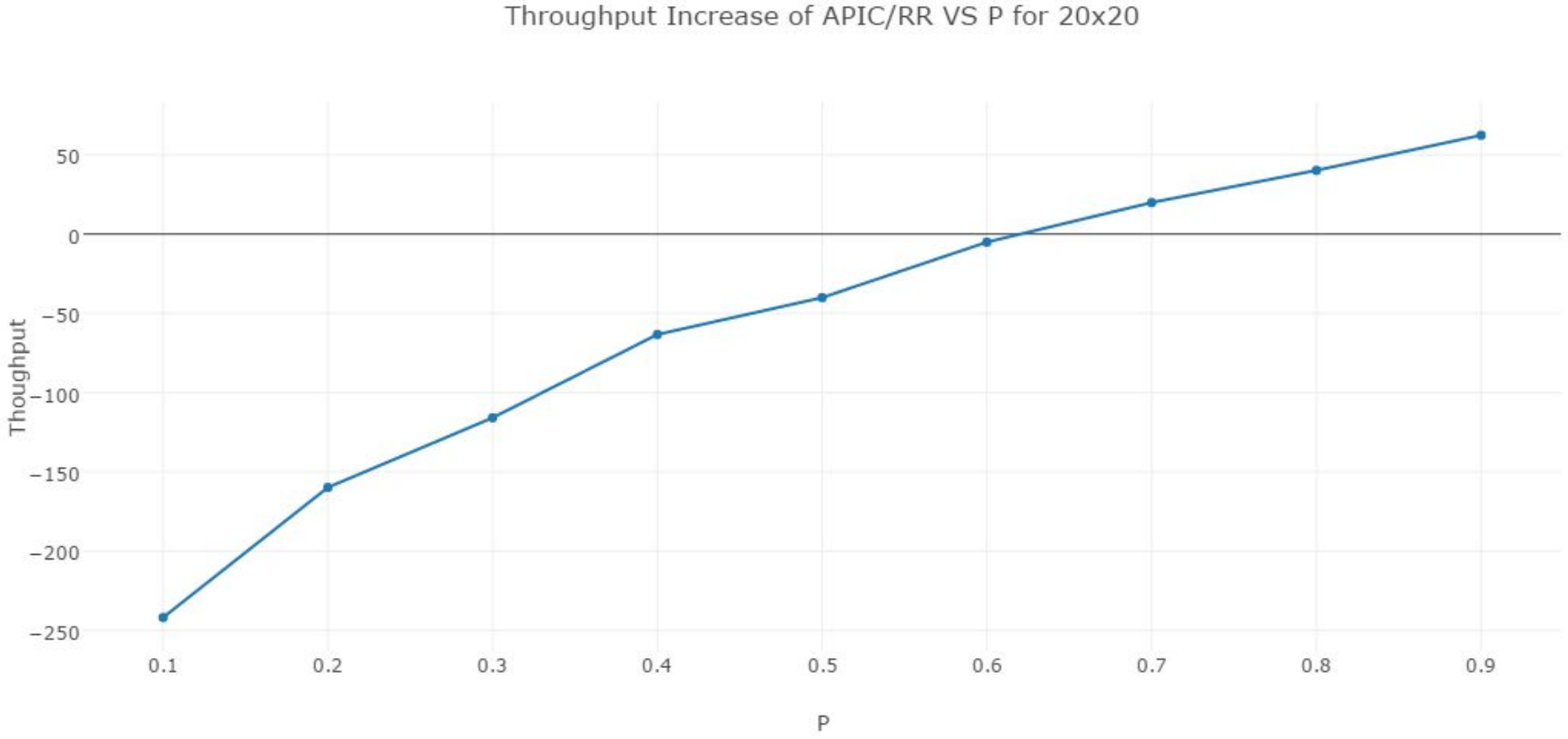

Minimum Rank VS P of 50x50
Rmin
40
35
30
25
20
15
10
5
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P

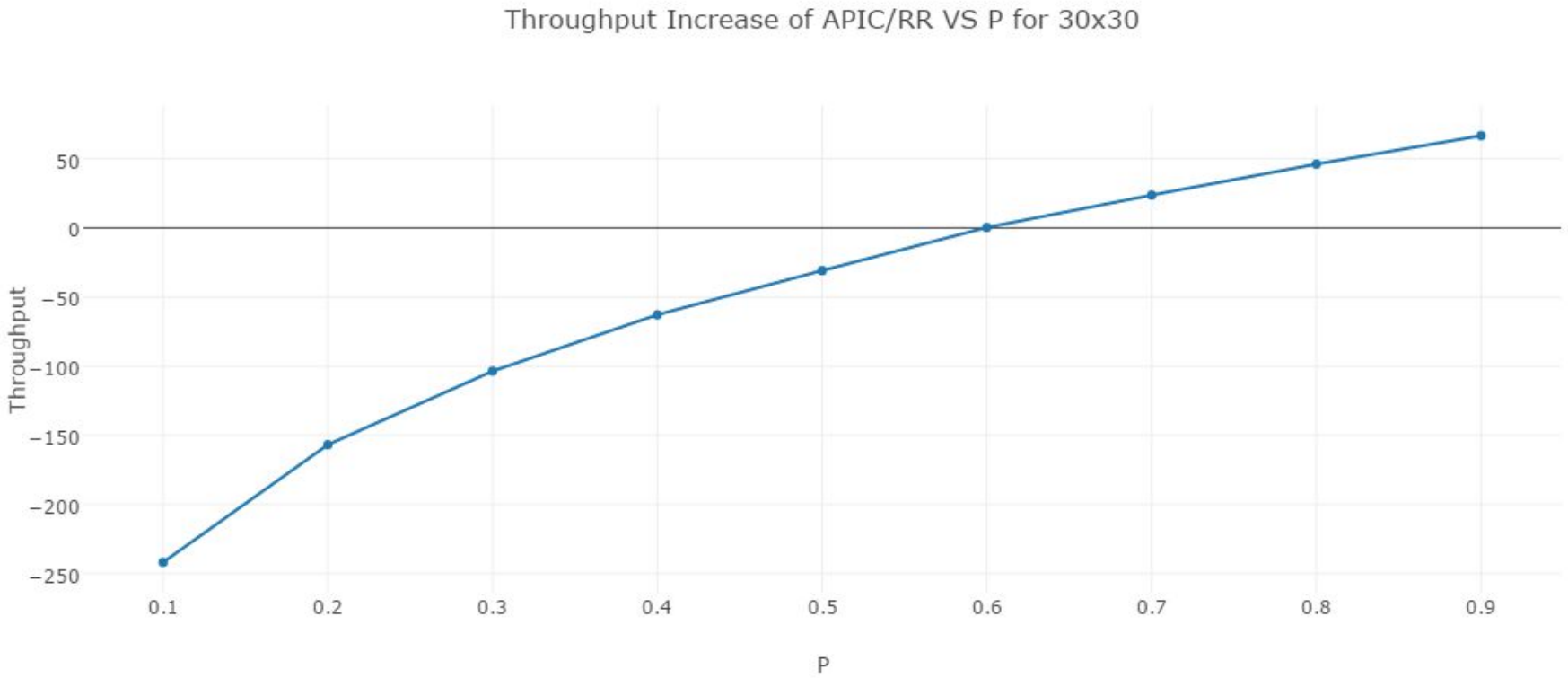

Minimum Rank VS P of 60x60
Rmin
40
30
20
10
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P

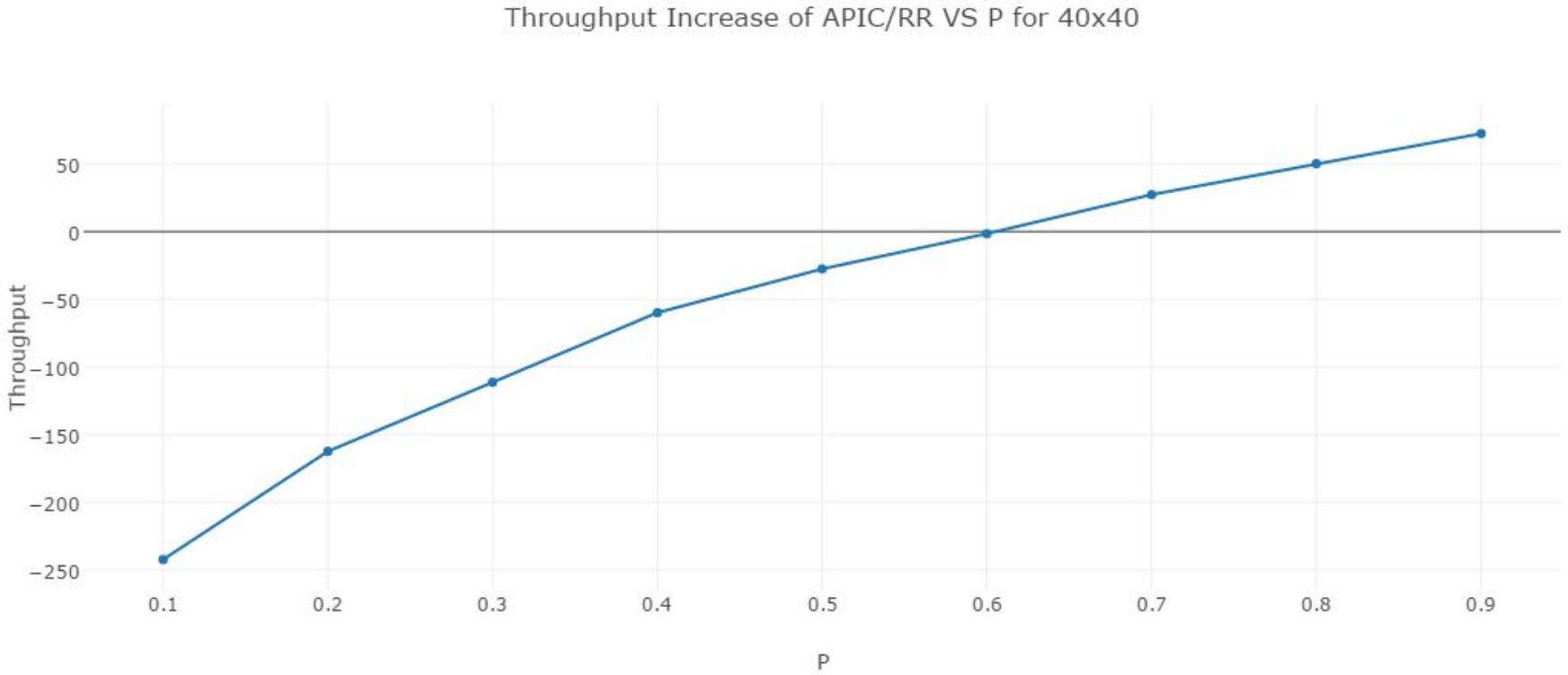

Minimum Rank VS P of 70x70
Rmin
50
40
30
20
10
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P

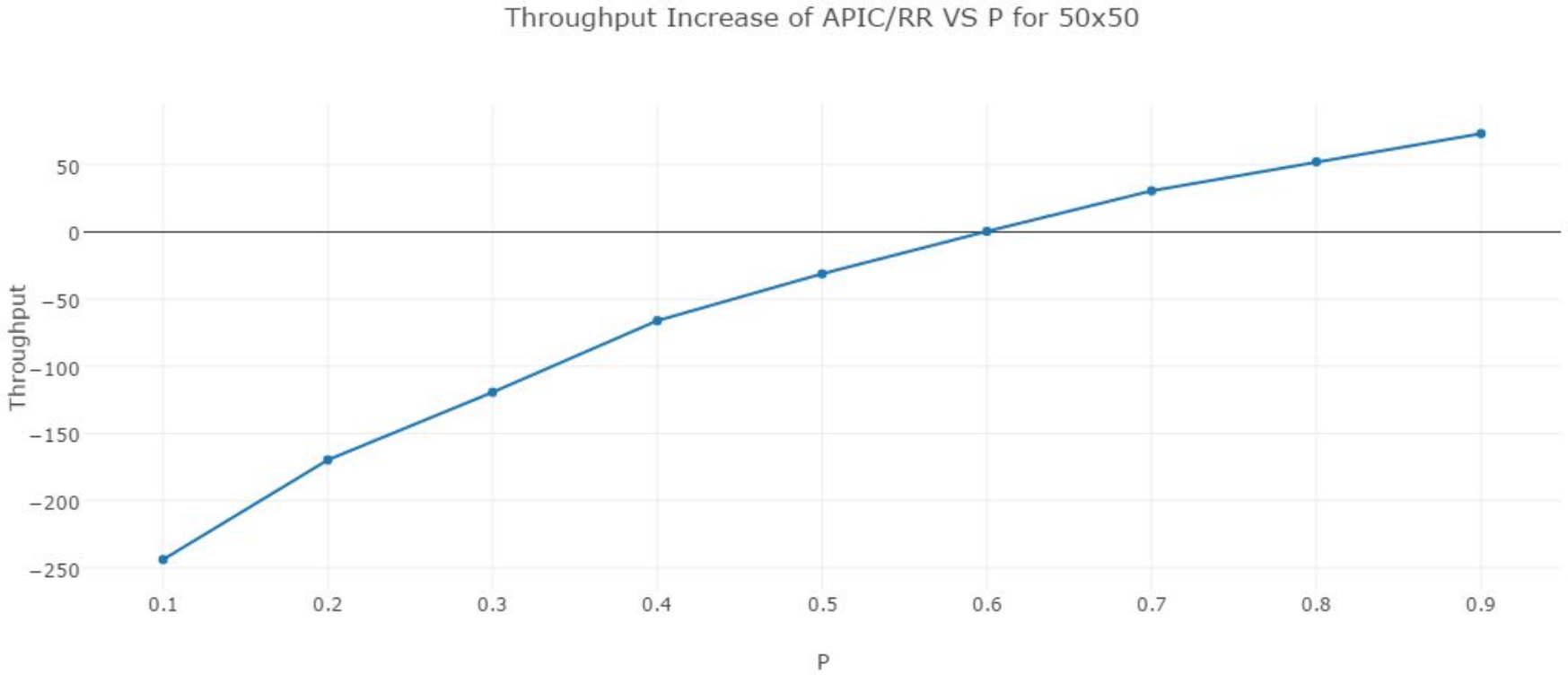
Throughput Increase

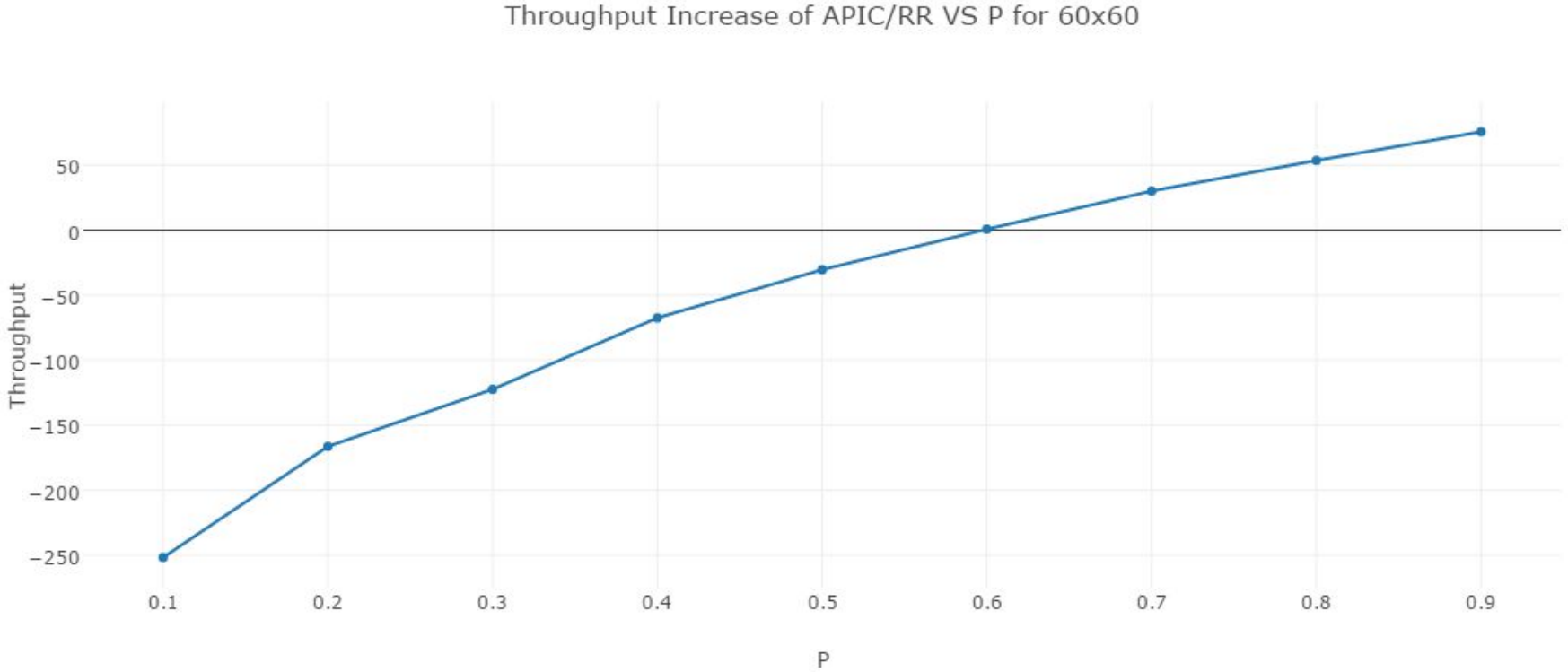
- Throughput increase = (RR - APIC) / RR
- The probability of receiving signal remains constant through phase 1 and 2
- Phase 1: initial transmittion of messages
- Phase 2: retransimittion of messages until received by everyone

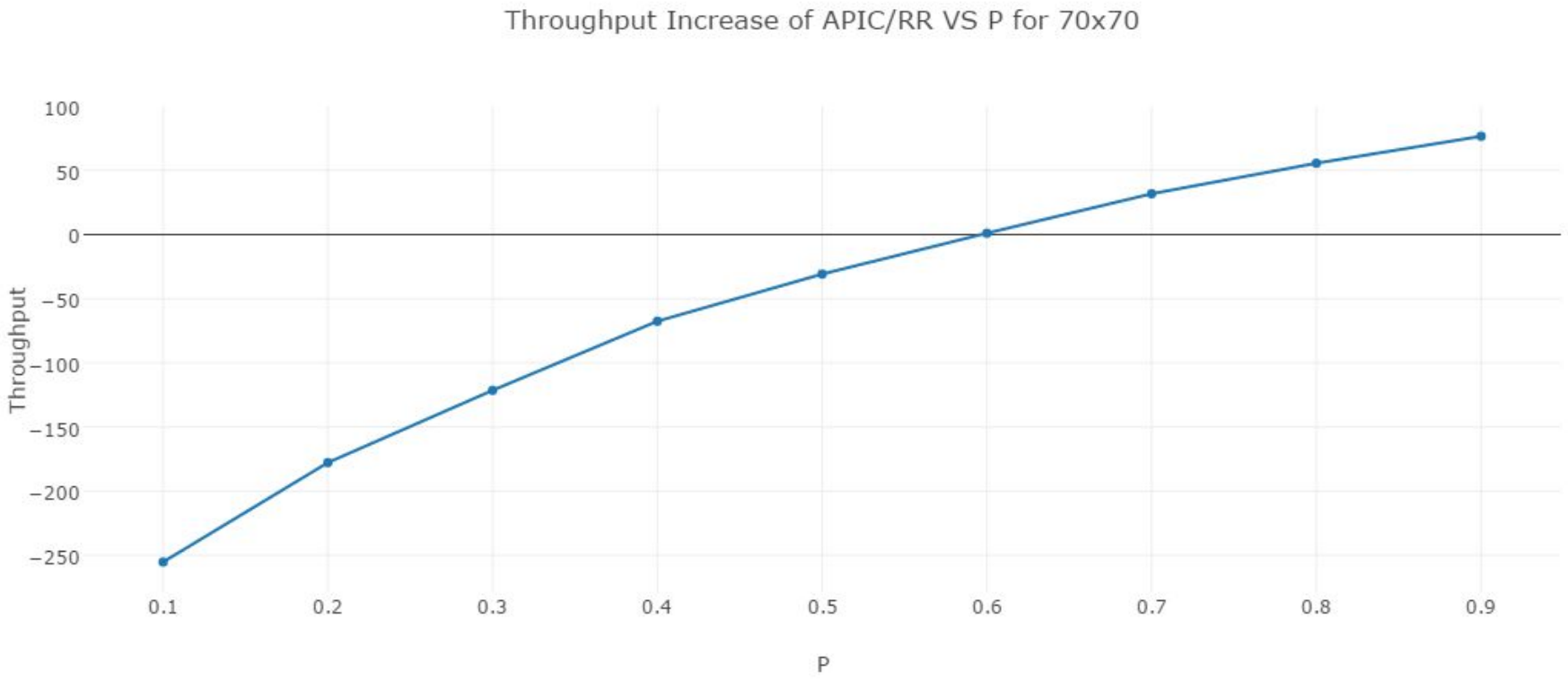

Throughput Increase of APIC/RR VS P for 20x20
50
0
−50
−100
−150
−200
−250
Thoughput
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Throughput Increase of APIC/RR VS P for 30x30
Throughput
50
0
−50
−100
−150
−200
−250
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Throughput Increase of APIC/RR VS P for 40x40
Throughput
50
0
−50
−100
−150
−200
−250
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Throughput Increase of APIC/RR VS P for 50x50
50
0
−50
−100
−150
−200
−250
Throughput
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Throughput Increase of APIC/RR VS P for 60x60
50
0
−50
−100
−150
−200
−250
Throughput
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P


Throughput Increase of APIC/RR VS P for 70x70
100
50
0
−50
−100
−150
−200
−250
Throughput
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
P

Conclusion

- Throughput gains for APIC vs RR only begin for P = ~.7
- Gains can be very high for P = .9
- If different P was used for phase 1 and 2, gain would be more spread throughout different Ps
- Recursive APIC could be used after phase 2 to continue to reduce the number of messages