

# Scientific Research Paper

## “New conjectures of primes distribution in natural numbers sequence”

### Summary

This study introduces new conjectures of primes distribution in natural numbers sequence.

The prime numbers play a significant role in theoretical mathematics disciplines and in general and have practical usage in specific areas.

Nowadays time, primes are widely used in data encryption, which has become a hot point in the 21st century. The higher primes you get – the higher the security level could be quarantined.

As now computer power increase exponentially, small primes do not work anymore – brute force could decrypt it in a reasonable time. So, new algorithms for finding higher primes values could guarantee better data security protection by preventing finding decryption keys.

### History flashback

There were 2 main milestones in problem evolution:

- Bertrand's postulate (introduces in 1845, proved in 1852)
- Oppermann's conjecture (introduced in 1882, not proved yet), nowadays best Bertrand's postulate strengthening.

Oppermann's conjecture identifies an interval containing **one** prime.

Our conjecture works differently – it provides intervals, containing a **defined** number of primes.

As a result, our conjecture works better, when there is a need to get multiple primes at once, instead of getting them one by one in Oppermann's case.

### PROS for our conjecture

Nowadays Bertrand's postulate is used for primes searching because it is the only proven hypothesis about primes distribution in natural numbers sequences.

As our research is in the conjectures phase now, it could not fully replace Bertrand's postulate.

But we've made some research on sample computer tests, taking the first 3.000.000 intervals and the result is positive – our conjectures were confirmed.

We think that our conjectures could be easily proved because they are defined by the Binomial coefficient, which is explored very well.