Inverse HuaLuogeng's "Exception Set" Method

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Abstract. Hualuogeng for goldbach conjecture raised an exception collection methods: use a fraction value indicates the possibility of goldbach conjecture fails, take to infinity, the denominator fraction value infinite close to 0, come out a conclusion that goldbach conjecture is not set up the possibility of infinite close to 0. In this paper, the author USES the method of opposite to hualuogeng, with a score value indicates the possibility of goldbach conjecture was set up, the denominator is fixed, molecular ceaseless overlay, molecule is more and more big, such fraction value infinitely close to 1, thus it is concluded that the possibility of goldbach conjecture established infinitely close to 1.

1. Introduction

In his 1742 letter to euler, goldbach proposed the following conjecture[1]: any integer greater than 2 can be written as the sum of three prime Numbers. But goldbach himself could not prove it, so he wrote to the famous mathematician euler to help prove it, but until his death, euler could not prove it. Since "1 is a prime number" is no longer used in mathematics, the modern statement of the original conjecture is that any integer greater than 5 can be written as the sum of three prime Numbers. (n>5: when n is even, n=2+(n-2), n-2 is also even, which can be decomposed into the sum of two prime Numbers; When n is odd, n=3+(n-3), n-3 is also even and can be decomposed into the sum of two primes. A common statement of conjecture today is euler's version. The statement "any sufficiently large even number can be expressed as the sum of a number with no more than a prime factor and another number with no more than b prime factor" is called "a+b". I. 2 solved ways

Four ways to study even number goldbach conjecture. These four paths are: almost prime number, exception set, three prime number theorem of small variables and almost goldbach problem.

1.1 Almost a prime number

An almost prime number[2] is a positive integer with few prime factors. If N is even, it cannot be proved that N is the sum of two prime Numbers, but it is sufficient to prove that it can be written as the sum of two almost prime Numbers, that is, N=A+B, where there are not too many prime factors of A and B, for example, the number of prime factors is not more than 10. Use "a+b" to express the following statement: every large even N can be represented as a+b, where a and b have no more prime factors than a and b, respectively. Obviously, goldbach's conjecture can be rewritten as "1+1". Progress in this direction has been made by the so-called sieve method.

Progress on the "a + b" issue

In 1920, brown of Norway proved "9 + 9".
In 1924, Lattmacher of Germany proved "7 + 7".
In 1932, Esterman in the UK proved "6 + 6".
In 1937, Italy's Lacie proved "5 + 7", "4 + 9", "3 + 15" and "2 + 366".
In 1938, Bukhshtyaber of the Soviet Union proved "5 + 5".
In 1940, the Soviet Bukhshtyaber proved "4 + 4".
In 1956, Wangyuan of China proved "3 + 4". We later proved "3 + 3" and "2 + 3".
In 1948, the Hungarian Rani proved "1 + c", where c is a large natural number.
In 1960, Pan Chengdong of China and Barbam of the Soviet Union proved "1 + 5" and Wangyuan of China proved "1 + 4".
In 1965, Bukhshtyaber and Vinogradov junior of the Soviet Union and Bembeli of Italy proved "1 + 3".
In 1966, China's Chen Jingrun proved "1 + 2".

Chen Jingrun (May 22, 1933 -- March 19, 1996) was a contemporary mathematician of Fuzhou, Fujian Province. Mainly engaged in analytical number theory research, and Goldbach conjecture research in the international leading results. In the 1950s, important improvements were made to the inner lattice point of Gaussian circle, inner lattice point of sphere, Tarim problem and Hualin problem. In May 1966, he proved the proposition "1+2", which greatly advanced the proof of Goldbach's conjecture that had not been solved for more than 200 years. This result was known as "Chen's theorem" in the world, and he improved it later.

In 1957, Chen Jingrun[3] was transferred to the Institute of Chinese Academy of Sciences. After more than 10 years of calculation, in May 1966, he published his paper "table big even number is a prime number and a not more than two prime number product sum". The publication of the paper has been highly valued and praised by the world mathematics circle and famous mathematicians. The British mathematician Haberstein and the German mathematician Licht wrote Chen Jingrun's paper into a mathematics book, called "Chen's theorem".

Wang Yuan was born in Zhenjiang, Jiangsu Province on April 30, 1930, and his native place is Lanxi, Zhejiang Province.

In 1948, Wangyuan was admitted to the mathematics department of Zhejiangyingshi University. After graduating from the Department of Mathematics of Zhejiang University in 1952, he was recommended to work in the Institute of Mathematics of the Chinese Academy of Sciences, under Hualuogeng. In 1980, he was elected member of the academic department of the Chinese Academy of Sciences. In 1984, he was awarded the title of "outstanding national young and middle-aged expert with outstanding contributions". In 1999, he won the Hualuogeng Prize for Mathematics.

Wang Yuan's main research field is analytic number theory and its application, promoting the development of modern mathematics in many fields and the popularization of mathematical methods. Wang Yuan integrated the methods of Bukhshtabu, Bukhshtabu, and Selberg and proved \{3,4\} at first. Furthermore, Kuhn's method is combined to prove \{a, b\} (where a+b≤5) and \{3,3\}; Finally, in 1957 \{2,3\} was proved. This is the first time that Chinese scholars have taken the world's leading position in the study of Goldbach's conjecture in number theory, and the later powerful screening methods are related to Wangyuan's synthesis of the above methods. After the publication of the results, they soon attracted the attention of colleagues at home and abroad. In his monograph number theory published in 1960, Bukhshtabu listed the results \{2,3\} of Wangyuan as theorems. He proved \{1, 4\} and \{1, 3\} under the assumption that the generalized Riemann Hypothesis (GRH) is true, thus improving \{1, 6\} proved by Esterman under the same assumption. In 1975, Wangyuan, Pan Chengdong and Ding Xia-Qi published a very simple simplified proof of \{1, 2\}. Wang Yuan's achievements on sieve method and Goldbach's conjecture have attracted attention in the world.

Pan Chengdong[4] has made outstanding achievements in the research of analytic number theory, especially in the "Goldbach conjecture" for the Chinese and foreign mathematicians praise. He also devoted himself to writing books and cultivating young talents. Goldbach conjecture, which he co-authored with Pan Chengbiao, is the first comprehensive and systematic academic monograph in the history of "conjecture" research. It has been evaluated by mathematicians at home and abroad as "successful re-creation" and "another new work in the research Treasury of analytic number theory".
From 1956 to 1960, he was mainly engaged in the research on the distribution of the zero point of $L$-function, and first obtained the upper bound quantitative estimation of the minimum prime number in the arithmetic series, which was widely used as a theorem.

From 1961 to 1965, he mainly engaged in the study of Goldbach's conjecture, which was regarded as the pearl in the crown of mathematics. Panchengdong's achievements in analytic number theory mainly include the following aspects: 1: minimum primes in arithmetic sequences, 2: Goldbach's conjecture, the great sieve method, and the mean value theorem of the distribution of primes, 3: trigonometry and estimation of prime variables on intercell and the three prime number theorem on intercell, 4: exception set of Goldbach Numbers, 5: the great sieve method and its application.

1.2 Exceptions to the rule set
Take a large integer $x$ on the number line, and then look ahead from $x$ to find the even Numbers that make Goldbach's conjecture invalid, namely the even Numbers of exceptions. The number of even exceptions before $x$ is denoted as $E(x)$. We hope that no matter how big $x$ is, there's only one exception to the even number before $x$, which is 2, which is the only one that makes the conjecture wrong. So the Goldbach's conjecture is equivalent to $E$ of $x$ is always equal to 1. And, of course, until now we couldn't prove that $E$ of $x$ is equal to 1; But it turns out that $E$ of $x$ is much smaller than $x$. The number of even numbers in front of $x$ is roughly $x$ over 2; If the ratio of $E(x)$ to $x$ approaches zero as $x$ approaches infinity, it means that the even density of these exceptions is zero, which means that Goldbach's conjecture holds true for almost all even Numbers. So that's the idea of the exception set.

Vinogradov's three prime number theorem was published in 1937. The following year, on the path of exception set, four proofs appeared simultaneously, including Mr. Hualuogeng's famous theorem.

1.3 Three prime number theorem
If the even Goldbach conjecture is correct, the odd conjecture is also correct. Given that odd $N$ can be expressed as the sum of three prime $[5]$

Numbers, if it can be proved that one of the three prime Numbers is very small, for example, the first prime number can always be 3, then we have proved even Goldbach's conjecture. This idea led Mr. Pan chengdong, in 1959, at the age of 25, to study the theorem of three prime Numbers with a small prime variable. This small prime variable does not exceed $N$ to the theta power. Our goal is to prove that theta can be 0, that the small prime variable is bounded, and thus derive an even number of Goldbach's conjecture. Mr. Pan chengdong first proved that theta is 1/4. For a long time, there was no progress in this aspect until professor Zhantao pushed Pan's theorem to 7/120 in 1995. This is a small number, but it's still greater than 0.

2. Inverse Hualuogeng's "exception set" method
For Goldbach's conjecture, Hualuogeng has a macroscopic probability method $[6]$, called "exception set". The main principle is to make the probability of Goldbach's conjecture not valid approach 0 indefinitely.

2.1 Hua's method
Take a large integer $x$ on the number line, and then look ahead from $x$ to find the even Numbers that make Goldbach's conjecture invalid, namely the even Numbers of exceptions. The number of even exceptions before $x$ is denoted as $E(x)$. We hope that no matter how big $x$ is, there's only one exception to the even number before $x$, which is 2, which is the only one that makes the conjecture wrong. So the Goldbach conjecture is equivalent to $E$ of $x$ is always equal to 1. And, of course, until now we couldn't prove that $E$ of $x$ is equal to 1; But it turns out that $E$ of $x$ is much smaller than $x$. The number of even Numbers in front of $x$ is roughly $x$ over 2; If the ratio of $E(x)$ to $x$ approaches zero as $x$ approaches infinity, it means that the even density of these exceptions is zero, which means that Goldbach's conjecture holds true for almost all even Numbers. So that's the idea of the exception set. In 1924, Hualuogeng graduated from Jintan county junior high school. In 1931, he was transferred to the mathematics department of Tsinghua University. In 1936, he visited Cambridge University in England. In 1938, he was appointed professor of Tsinghua University. In 1946, he became a researcher at...
the institute of mathematics, Princeton university and professor at the university of Illinois. He was
elected academician of academia sinica in 1948. Arriving in Beijing from the United States via Hong
Kong in the spring of 1950, he wrote an open letter to all Chinese students studying in the United
States on his way home. In 1951, he was elected chairman of the Chinese mathematics society, and in
the same year, he was appointed director of the forthcoming institute of mathematics. Member of the
standing committee of the first to sixth National People's Congress of the People's Republic of China
from 1954 to 1988; In 1955, he was elected member of the academic department (academician) of the
Chinese academy of sciences. In 1982, he was elected as a foreign member of the national academy of
sciences. In 1983, he was elected as an academician of the third world academy of sciences. In 1985, he
was elected member of the Bavarian academy of sciences.

Hualuogeng mainly engaged in analytic number theory, matrix geometry, typical group, self-
defensive function theory, polymorphic function theory, partial differential equation, high dimensional
numerical integration and other fields of research; The problems of estimating gaussian complete
trigonometric sums, the improvement of hualin and tarim problems, the proof of fundamental
theorems of one-dimensional projective geometry, and the application of modern number theory
methods are also solved. It is listed as one of the 88 great mathematical figures in the world in the
museum of science and technology in Chicago. The international mathematical research achievements
named after Fahrenheit include "Fahrenheit theorem", "Fahrenheit inequality", "hua-wang method" and so on.

3. contrary method
My method, contrary to hualuogeng, makes the validity of goldbach's conjecture approach 1 infinitely.
All even Numbers plus 3 are the sum of two primes. If the number of primes is p, there are p even
Numbers that can be expressed as the sum of two primes.

All even Numbers plus 5 are the sum of two primes. If the number of primes is p, there are p
even Numbers that can be expressed as the sum of two primes. Combine 1 and 2, and there are 2p even
Numbers that are the sum of two prime Numbers, and of these 2p even Numbers there are m1 even
Numbers that overlap, m1 is the number of prime pairs that differ by 2, so there are 2p - m1 even
Numbers that are the sum of two prime Numbers.

All even Numbers plus 7 will give you the sum of two primes. If the number of primes is p, there
are p even Numbers that can be expresseddas the sum of two primes. Combine 1, 2, and 3, and you have
2p - m1 + p = 3p - m1 where even Numbers are the sum of two primes, and m2 of the 3p - m1 even
Numbers are the sum of two primes.

All the even Numbers plus n, all the even Numbers are the sum of two primes. If all the prime
Numbers are p, there are p even Numbers that can be expressed as the sum of two primes. Comprehensiv
1, 2, 3......This time we have np - m1 - m2 - m3...Mn even Numbers are the sum of the two prime Numbers.

Suppose p - m1 = q1, p - m2 = q2, p - m3 = q3...The p - mn = qn....
If all even Numbers are k, then the coverage of goldbach's conjecture is:
Q = (p + q1 + q2 + q3.....+ qn +....)/k.
The denominator is a constant, and the denominator is getting bigger and bigger, so this value is
going to get closer and closer to 1.

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