Memoir of Goldbach Conjecture

Zhong Wang

February 28, 2019

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Preface

The main reason for me to write this book is to publish my proof paper for Goldbach Conjectures.

You will find that the latest revision (see section 13.1) of my proof paper has been formal, professional, a rigorous logical deduction. It is an shortest simplest Occam's Razor's clean-cut and elegant answer.

Unfortunately, when I submitted latest version to Journal of American Mathematical Society, Acta Mathematics, Mathematika of London Mathematical Society, they all rejected it after all. With few words of communication to debug, I asserted that math journals would not like to accept anything about Goldbach Conjectures which seems a taboo for all math societies. The reason is haunted. I presumed that the possibility of successful submission to any other math journal is near zero. I also tried to put it on the website arxiv.org. Due to without endorsement, I couldn't do it.

About the Author

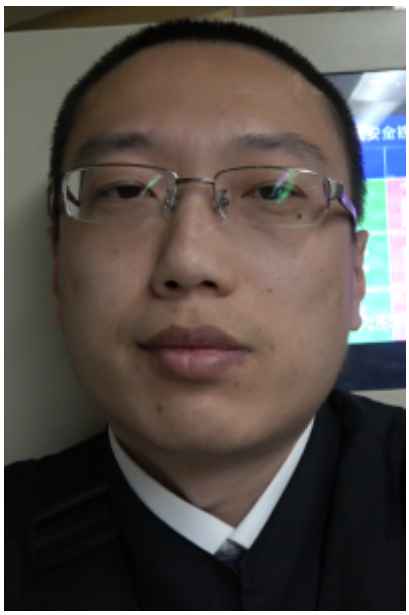

Figure 1: Selfie 2016-04-17

Hi, my name's Zhong Wang. October 18, 1981, I was born in the city of Tsingtau, China. A coder.

> "Your life is just a tragedy." my mother said to me.
>
> "Let him live alone and extinguish alone." said my father to my mother.

Chapter 1

1983? a Story in Kindergarten

I went to kindergarten a few months. I don't remember much of it, a house with few rooms, kindergarten-style painted, around 20 kids, just stayed indoor doing nothing particular interesting, mostly eating and sleeping. But one event lasts in my memory.

One summer day afternoon, day becomes darker, the miss decides to teach us kids how to make a clay figure at the end of a day. She arranges all kids sitting in their tiny chairs and tiny desks as a class. then she prepares a lot of rounded and oval chunks of dark-colored plasticine, and then distributes them equally into small light-yellow straw-plaiting baskets, and then places each basket next to each kid on the ground. In each basket it also contains two mung beans and other sort of beans.

During her preparation, she chats with another miss. I see her activity and have already figured out her next move. When I have my basket next to my feet, I take on the building work. I touch legs and arms to the big body and I put beans on the head carefully as its eyes, nose and mouth. Nothing difficult. I have already finished a man before she sits down in her own small chair and announce "Today, I am going to teach you to make a small man." During her tutoring steps, she realizes that I am not doing anything. With her further perception, she finds that I have already done it. She is not pleased. After a while, she orders me to stand along the wall and watch the class's going as a punishment. This is my only clay work class in my life.

I remembered that when I was a baby, I was always scared of the kindergarten and strangers from first day.

Chapter 2

1985? Psychological Tests

One summer afternoon in my 4 maybe, one of my aunt bought me a suit and toke me a photo. Days later, in another afternoon between 14:00-15:00, she toke me to a clinic-like place with a big mirror and toys on a table. At the time, I knew nothing. Now I know it is a well-known psychological survey test for toddler's lying. After the test began, I immediately toke myself close to the mirror a one-way glass and stared at myself. Making more troubles, I watched the toys for a bit while which very cheap and dirty. A female tester in her mid 20 in doctor-like white coat and the aunt showed up several times to force me to concentrate on the toys. After a long thought, I slightly touched one of the toys by two fingers once and immediately dropped. When the test sought my action, she immediately came out of the door next to the mirror and asked me the question "Have you touched the toy?". I said "yes". They asked me again. I said "no". After back and forth several times, they gave up.

Another morning, in a children's playroom, at first the tester gave me a toy a hollow box and ordered me put toy blocks with different shape inside. And then I was given a book which with a lot of crosses, circles and square boxes questions. By crawling on the ground, with aunt's close presence, I was putting my tiny little finger on each answer I thought correct. I once gave up at middle, but the aunt provoked to go on. I did all questions till the question on the second last page which had token me for a while before I gave up. When the tester returned from counting score, my aunt asked her my score. She replied "210" and a second later she corrected herself "160". On the way back to my aunt's home by bus, I thought the crosses, squares and triangles game was very fun. Unfortunately, this game I have played only once in my life.

Another day, another location, I don't remember when and where the testing of which ear hearing a word first from a headset, EEG and MRI were taken place.

Chapter 3

1999/11 First Job

Early November, 1999, I got a part-time job in a downtown KFC restaurant after 9 years in school. Starting from ¥2.1/h , each shift was 4-hour long, a physical intense labor. I only got ¥200, ¥300, rarely ¥400 on each month. Even with that low wage it did not stop someone prey on me.

There were two female shift managers were very mean, always picky to my job, and it seemed only to me. One named Li was super mean and particular picky. Maybe one day I refused her order to hustle a wanderer to get out which I thought that was illegal, pitiless and mean. Later days, she and another one tried to fire me once or twice. Luckily, the manager board voted to support me to stay. After the meeting, my job was permanently changed from S1 workstation the main dining hall to the souse workstation where I spent entire service time. The only reason for me to keep my job I think is I was an cheapest proficient obedient labor, weak and speechless.

Her night shift always began before 16:00 when morning shift was off. One summer afternoon, power failure occurred and lasted for 2.5 hours. Li rejected and deleted everyone including me, young misses and boys, on morning shift's worktime on timecard by 2.5 hours.

She and another one had always forced me to go on working for free after my shift was off by threating me for my entire service time. But, any other manager would fairly lengthen the worktime to the exact time I finished. My wage stopped at ¥3.4. Employees came later even half year later than me had become star employee with wage ¥3.6, my superior.

I think she disliked me so much that each time my appearance to her sight might provoke her hatred emotion. Today, me as a programmer, my wage is more than CNY ¥10,000 per month. I think she and the other one were just crazy.

Literally and seriously, I was always starving, barely survived, at that age, I had nothing from all aspects. The only thing I could do is to breath.

Meanwhile a butterfly flapped its wings on other side of the Earth. A news came out that some British company offered GBP £1 Million in prize for who

solved Goldbach Conjecture. I started to think of it. At that time I bought myself a typewriter with ¥400 for hobby. By it I made myself a paper strip for natural sequence which every prime number was typed in red, others in black.

June, 2001, after one and half years, my toil service ended in vain, hostile, humiliating, humble, terrible situation. I was still absolute poor but I got diskal hernia, occasional high blood pressure and arthritis from intense physical labor. I grew between 2cm to 3cm in body height, my mind was more active, early adult thinking was initiated, due to high protein working meals. From occupational habit, subconsciously I was always doing things efficiently and quickly.

Chapter 4

2001/09 Discover

Early September, 2001, may be a week before 911, in the night, maybe 21:17, after 3 days serious thinking, I thought I solved it. At that moment, I was thrilling alone in my own dark room, my heart was beating fast as adrenaline's rising. Next to the moment, I decided once and bought myself a ¥20 bottle of wine back and toasted myself as celebration. Later I regretted that champagne should be better. After maybe one and a half month scratching my head, I finished the first version, my very first paper with my very first PC of my life.

Chapter 5

2001/11 Post the First Version

After I finished the first version, I mailed it to Chinese Math Research Institution, and post it to the math journal of Science China. November 25, 2001, I tried to mail myself a copy. I told the worker in the post office, my request. He timestamped on the front of the envelop. I said that might be not rigorous enough. He then timestamped on the seal on the back and handed it back to me. It became an evidence today.

December, after I failed to publish, I bought myself a P.O. box numbered 9600 to receive mails. I spent ¥180 to establish a website n43e120.com to publish my paper on it. I went to a local newspaper and gave them a copy, hoping that they could report. Later it turned out that they had done nothing.

5.1 Phone Call Math Journal of Science China

A few days later, after I mailed my paper to the math journal of Science China, I called the journal and asked the editor if they had received my paper. A 40-year-old female editor she replied "your kind, We don't collect." in Chinese word to word translation. Then I asked her twice "Have you read my paper?" She repeated the last sentence. Conversation ended.

5.2 Revision 20011125 First Version

File size is too large to show conveniently.

Chapter 6

2002/03 TV Says £1M Prize Has Expired

One day afternoon, maybe 15:30, March, 2002, my mother called me to watch TV. "Today is the day that the 1 million pounds prize for Goldbach Conjecture has expired" the host said in a interview program going alive on the channel CCTV-1.

I remember the host was Yu Zhang and the two guests were the director of Chinese Math Research Institution and a psychology doctor in a blue jean suit. You could tell from the screen that the math director was red-eyed, very unpleased and emotional, seemed like he was disturbed from a deep sleep. When the host asked the director how long will the problem be solved, he arbitrarily picked up a number 10 years. The other guest wearing a jean suit was a total misery. It was a painful footage, so ridiculous and dramatic scene that only can be watched from a fairy tale.

Chapter 7

2006/02/17 Submit to Journal of Number Theory of Elsevier

February 17, 2006, I had another try. I submitted it to Journal of Number Theory. Weeks later, it was rejected.

20060201.pdf

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20061231.pdf

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Chapter 8

2018/10/04 Review and Email with MSRI

August, 2018, I had received the certification of authorization of my patent after 4 years effort. I wrote my patent in my resumé next to my proof. When I open the old box, I found my old proof paper.

At that time, Sir Atiyah claimed on the meeting of International Congress of Mathematicians that he proved Riemann Hypothesis. So, many science video creators made many videos to talk about number theory, prime number and Goldbach Conjecture. With inspiration of new knowledge I got, I rethought and reproved it in Mathematica. In fact, in all there years I doubted myself because I had forgotten everything. After I had remembered everything, I remembered I was right. So, I decided to publish the suspended paper once for all.

I posted the Mathematica version on my Github page and spent ¥200 on advertising buying 20k views on social media. I posted a thread and tried to get attention and help. I only got some unfriendly feedback.

Then I emailed MSRI.

2018-10-13 10:17

Dear Good Day Mr./Mrs. Mathematician at MSRI:

I demand your professional opinion.

Story is this:
My name's Zhong Wang. I proven the G conjecture at 2001. at that time i was 20, stupid young. I could not find place to publish it. So I published it online on my website (DNS www.n43e120.com unavailable right now). I emailed very address i could find. Nobody responsed my email. Like i am falling into a blackhole.

there are only very few tiny winny evidences:

When you'd ever googled keywords "Goldbach conjecture" between 2002 to 2004. you would that my paper sat right at top result. at that time i was poor no job without a penny. this is not my ads.

And maybe 2004 ICM is held at my hometown town TsingTau.
And I watched After meeting TV casual interview, a mathematician, just one, randomly he mentioned that he heard the Bach music that all music notes are synmetric. Of course nobody disallows a free man talks about anything at a math meeting.

Back to today (several days ago exactly) I reviewed my work on this piece sheet. I still believe i war richig.
So i refurnish the paper with a few modern tech (Mathematica)

and put it on this URL
https://github.com/n43e120/blog/blob/master/GoldbachsConjectureReview2018en.pdf

Please please give me some official response.

As my blog, i don't care fame or money.
But I need a EB-1a visa. so I have to do this.

Thank you

R.S.V.P

WANG, Zhong

Tsing Tau
2018/10/3

2018-10-15 23:44

Dear Mr. Wang,

Mathematicians in this area have heard so many times from amateurs who think they have proofs and don't, that the only way that you are likely to get attention is to find a mathematician or graduate student at a local university, and work through the proof with them to verify it AND put it in a professional form of exposition. You might need to pay such a person for working with you on it.

I'm sorry that I can't help you further with this.

Cordially,

David Eisenbud
--
David Eisenbud
Director, Mathematical Sciences Research Institute; and
Professor of Mathematics,University of California, Berkeley
www.msri.org/~de

2019-01-22 18:04

Dear Prof. Eisenbud, the Respectful Director of MSRI:

Very grateful to received last your helpful note which just encouraged me further down the road. short history for the passed months:

Nov. 13th, 2018, after taught myself and written a formal paper, paid a company to correct errors, and then I posted to Journal of AMS .

Jan. 15th, 2019, AMS rejected "due to the large volume of papers".

Jan. 16th, 2019, I asked the expert of the company who edited for me to endorse me on arXiv.org.

Jan. 22nd, 2019, the expert indirectly negative my request after edited again, for the reason that I am using probability to solve GC problem and some cases just below the line I drawed in the paper. I thanked his/her work.

Since very long ago, I'd tried with proper methods to contact with native academic professionals. but the result is creepy silence. I guess in a closed society there always are some problems which I never want to know.

I could hate, because I just miss Fields Metal by 2 months of birthday. But I don't need to be hating one who doesn't share much common ground or morality and virtue. History will finally tell the truth. And I believe that there are always some good guys on this planet who has morals and virtues. Since I can't get the Metal and price money, what it for is just for the truth and rightness in the god kingdom.

This Email claimed that the GC problems has been proven in this paper down below in the attachment. (P.S. This paper which has never ever try to solve it by probability which is proven very clearly with Lemma 7.) Please support me or endorse this email address on arXiv.org if you understand it. Or response with something you considered, I open for any discussion.

Great respect and thankful.
Zhong Wang

20181004.pdf

20181004.pdf

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20181004.pdf

Chapter 9

2018/10/19 Buy Books and Rewrite

October 19, 2018, I bought 6 books for ¥247 to learn to write a formal math paper. October 28, 2018, ten days later I finished writing a formal paper. English writing, number theory, formal paper writing all sounded unfamiliar for me. Done it professionally and successfully liked an impossible.

Figure 9.1: 20181019 book order

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Chapter 10

2018/10/29 Spend Money to Polish

October 29, 2018, I spent ¥3608 to polish my paper. The result came back at November 9. Author's name's removed and the title's changed to "Approximative Lowerbound of Prime Pairs". The editor also made a commentary which looked like a serious review.

Missing all my logical deduction steps and my main idea, jumping right at a sounding excuse to subjectively deny, the editor argued that I was using probability to solve. Although I knew it is false, very unprofessional, absurd and rude, I had to let it pass and said nothing, because I can't blame one just helped you.

Commentary

Re: ■■■■

The paper fails to prove the Goldbach conjecture. This is because the lower bound given for prime pairs is approximative, and thus the proof is probabilistic, not rigorous. It is not hard to find cases for which the approximate lower bound is violated. For instance, when sieving 16, you start with eight pairs; p=2 removes four of them; then p=3 removes three of the last four (1,15), (3,13) and (7,9) – 3/4 removed, more than the supposed bound of 2/3. True, this erroneously treats (1,15) as a prime pair, as the paper notes, but that will count for at most one violation of the bound, when in fact it can be violated repeatedly in the sieving process.

Another case mentioned in the paper, n=992, is particularly egregious. It violates the approximative lower bound in a remarkable seven out of eleven cases. The calculation proceeds as follows:

- p=2 eliminates half, leaving 248 pairs.
- p=3 eliminates 165, leaving 83 pairs.
- P=5 eliminates 33, leaving 50 pairs.
- P=7 eliminates 15, leaving 35, violating the bound.
- P=11 eliminates 8, leaving 27, violating the bound.
- P=13 eliminates 5, leaving 22, violating the bound.
- p=17 eliminates 4, leaving 18, violating the bound.
- P=19 eliminates 2, leaving 16, violating the bound.

- P=23 eliminates 2, leaving 14, violating the bound.
- P=29 eliminates 1, leaving 13, violating the bound.
- P=31 eliminates 0.

In order to be rigorous, the proof would have to account for these possible violations of the supposed bound. Unfortunately, the paper disregards such cases as rounding errors that are inconsequential to the problem.

Suppose you did try to account for them by noting that, at a given sieve step, at most $(2/p_i + d_i)$ of the remaining numbers are eliminated. For example, for 2n=16, $d_1 = 0$ and $d_2 = 1/12$. Suppose you could establish a reasonable upper bound for d_i. The entire lower bound, now rigorous, would instead be $(1/2)(1 - 2/3 - d_2)(1 - 2/5 - d_3)...(1 - 2/p_m - d_m)$, with m the number of primes less than sqrt(2n). There are then a total of $(2^{m-1} - 1)$ terms involving the error factors d_i. For the case of 992, there are a staggering 1023 such terms, so a bound on these error terms would have to be very strong to keep the rigorous bound of prime pairs greater than one. Worse, the number of error terms in such a product grows faster than the number being sieved. Since the distribution of numbers remaining will become very irregular after the sieve has been applied numerous times, you will no longer be able to say that a new prime p eliminates (1/p) of the remainders rounded up or down – for example, this is not true for p=17 in the case of 992.

Any serious math journal will have reviewers criticize the lack of rigor. However, it does appear that sieving methods are one of the active directions of research into the Goldbach conjecture, and many people have done work in that area. An early survey paper (■■■■) covers three different sieve methods. It may be a useful resource in improving your own method.

Chapter 11

2018/11/13 Submit to Journal of American Mathematical Society

After I received new revision, I removed every word might confuse readers that my proof is a probability guessing and submitted it to Journal of AMS. In next 2 months, I just waited patiently for the result. January 15, 2019, it was rejected for a reason of large pile of paper. This result shocked me. I was feeling blood's rushing into my head, it's adrenalin reaction. I was furious silently for the unfairness and injustice and the large volume of time just wasted.

20181113.pdf

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20181113.pdf

20181113.pdf

2018-11-13 21:02

Dear Author,

the Journal of the AMS has received your submission:

Date: 13 Nov 2018 08:02 EST
Title: Approximative Lowerbound of Prime Pairs
Author: Zhong Wang
E-mail: n43e120@163.com
Suggested Editor: Igor Rodnianski
Please note that your submission may be reassigned to another editor at JAMS.

Your manuscript will be reviewed for completeness by the AMS editorial staff and then forwarded to the journal editor (2 business days).

You can track the status of your article up to final decision at:

https://www.ams.org/editflow/ef/status.php?[redacted]

Please do not post this URL publicly, or share it with others.
Whoever has this URL can see everything on your article status page, and can also use the page to submit revisions of this article.
The parameters in this URL are part of your identity, and we strongly urge you to protect that identity.

Submission of unrequested revisions is discouraged. If SUBSTANTIAL modifications are absolutely necessary after initial submission, the above link can be used to resubmit your article. Please limit the use of this link to one resubmission.

This is an automatically generated message; please do not reply.
You may direct any questions regarding the submission process to jrnl-initsub@ams.org.

Electronic Prepress Group
American Mathematical Societ

2018-12-24 17:06

Dear Editors of Journal of the American Mathematical Society:

I'm an author of the article
Approximative Lowerbound of Prime Pairs
submitted on 13 November 2018.

*** AUTHOR: EDIT AS NEEDED ***
Should I receive good news as 2018 Xmas gift?

Thank you,
Zhong Wang

2018-12-27 04:22

Dear Author,

To get the status of the paper
181113-ZhongWang
Use this link:
https://www.ams.org/editflow/ef/status.php?[redacted]

If you need status information beyond what is displayed on the tracking page then you should contact the editorial committee directly at
journal.american.math.society@gmail.com.

Sincerely,

Linda Joyce
AMS

2019-01-15 22:30

Dear Professor Wang,

This message concerns the manuscript

Approximative Lowerbound of Prime Pairs
by Zhong Wang

submitted to the Journal of the American Mathematical Society.

I regret that, due to the large volume of papers we receive, we are
unable to accept your paper for publication.

Thank you for considering the Journal of the American Mathematical Society.

Sincerely,

Igor Rodnianski
Editor of Journal of the American Mathematical Society

Chapter 12

2019/01/16 Polish Again

After the rejection of AMS, I sent it to polish again and ask if I could put my paper on arxiv.org. The editor insisted his/her opinion about my paper and refused my request. I thanked "his/her elaborate work on this paper has critical impact which I cannot be more thankful."

Chapter 13

2019/01/26 Submit to Acta Mathematics

After I had a new revision, I submitted it to another journal named Acta Mathematics. Two days later, the journal rejected it for a reason of not meet the standard.

Approximative Lowerbound of Prime Pairs

January 22, 2019

Abstract

This paper establishes a formula that estimates an approximative lowerbound of prime pairs for even numbers, and proves that Goldbach's Conjectures are true.

Concepts

The Even Number $2n$

Let n be an arbitrary positive integer greater than 2, so $2n$ is an even number greater than 4.

Integral Array in $[0, 2n]$

Mathematica code:

```
In:n=10;Range[0, 2n]

Out:{0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20}
```

Obviously, there are total of $2n + 1$ integers in $[0, 2n]$.

Number Pairs

Definition 1. A *number pair* is two integers, whose sum is equal to $2n$.

```
In:Map[{#, 2n - #}&, Range[0, n]]

Out:{{0,20}, {1,19}, {2,18}, {3,17}, {4,16}, {5,15}, {6,14}, {7,13},
{8,12}, {9,11}, {10,10}}

In:Grid[{Range[0, n], Table[20 - x, {x, 0, n}]}]
```

Out: 0	1	2	3	4	5	6	7	8	9	10
20	19	18	17	16	15	14	13	12	11	10

Obviously, there are total of n number pairs in $[0, 2n]$.

Prime Pairs

Definition 2. A *prime pair* is a number pair, for which both members are prime.

For example, here is how many prime pairs there are for even number 20:

```
In:Map[If[PrimeQ[#], Framed[#], #]&, Range[0, n], Table[20 - x, {x,
0, n}], {2}];
Grid[%]
```

Out:

0	1	2	3	4	5	6	7	8	9	10
20	19	18	17	16	15	14	13	12	11	10

```
In:Map[{#, 2n - #}&, Range[0, n]];
Select[%, PrimeQ [#[[1]]] && PrimeQ [#[[2]]]&]
Out:{{3,17},{7,13}}
```

As the result shows, there are 2 prime pairs which sum to the even number 20.

However, how many prime pairs are there for an arbitrary even number?

Distribution of Prime Factors

Lemma 1. *Any integer greater than 1 can be considered a composition of one or more prime factors. The number of same prime factors is irrelevant.*

For example, to get all prime factors of number 20:

```
In:FactorInteger[20]
Out:{{2,2},{5,1}}
```

The number of same prime factors is irrelevant to this problem. Merging the same items into one, we get:

```
In:Map[#[[1]]&, FactorInteger[20]]
Out:{2,5}
```

Applied to all integers:

```
In:Range[2n];FactorInteger[%];Map[#[[1]]&, %, 2]
```

```
Out:{{1},{2},{3},{2},{5},{2,3},{7},{2},
{3},{2,5},{11},{2,3},{13},{2,7},{3,5},
{2},{17},{2,3},{19},{2,5}}
```

The integral array will become like the one above.
From the above result, we see that:

Lemma 2. *All prime factors, with phase starting from 0, are cyclic with constantly equidistant spacing and are distributed in an integral array.*

Lemma 3. *In* $[0, 2n]$*, there are a total of* $Floor(2n/p)$ *integers with prime factor* p*.*

Counting, there are a total of $2n/2$ integers with prime factor 2, $Floor(2n/3)$ integers with prime factor 3, etc.

Prime Factors for the Sieve of Eratosthenes

Lemma 4. *There is only a need for every prime factor less than or equal to* $\sqrt{2n}$ *to sieve in* $[0, 2n]$*. Any prime factor greater than* $\sqrt{2n}$ *should be ignored or considered as a hole in the array.*

For example, to sieve integral array $[0, 100]$, one only needs prime factors {2,3,5,7} ($\leq \sqrt{100}$).

Integers Remaining after One Sieve Step

Lemma 5. *After sieving away prime factor* p*, by which* $2n$ *is divisible, there will be exactly* $Round(2n/pq)$ *integers with prime factor* q *among the remainders.*

For example, after sieving away all integers with prime factor 2 in the integral array $[0, 2n]$, if $2n$ is divisible by 3, there will be exactly $n/3$ integers with prime factor 3 among the remainders. Otherwise, if $2n$ is not divisible by 3, there will be $Round(n/3)$.
Let p be the prime number for sieving. After one sieve step, the remainders will be approximately:

$$2n - 2n/p \tag{1}$$

Number Pairs Remaining after One Sieve Step

A number pair is sieved away when one of its member is sieved away. So after one sieve step:

If $2n$ is divisible by p, this many number pairs will remain:

$$n[(p-1)/p] \tag{2}$$

If $2n$ is not divisible by p, it is going to eliminate two pairs at each interval of the prime factor. So this many number pairs will remain:

$$n[(p-2)/p] \tag{3}$$

Prime Numbers Remaining after All Sieve Steps

Deducing from Formula (1) , by simultaneously sieving by all prime factors less than or equal to $\sqrt{2n}$, the following is the formula which estimates the number of prime numbers remaining in (p, 2n], where p is the last prime factor for sieving, which is less than or equal to $\sqrt{2n}$:

$$2n[(2-1)/2][(3-1)/3]\dots[(p-1)/p]-1 \tag{4}$$

Prime Pairs Remaining after All Sieve Steps

Deducing from Formula (2) and (3), by simultaneously sieving by all prime factors less than or equal to $\sqrt{2n}$, the following is the formula which estimates the least number of pairs of holes possibly remaining, where p is the last prime factor for sieving, which is less than or equal to $\sqrt{2n}$:

$$n[(2-1)/2][(3-2)/3]\dots[(p-2)/p] \tag{5}$$

Note. Formula (5) does not permit any number pair to remain, for which either member is less than or equal to p, and it does not expect $2n$ to be divisible by any prime factor other than 2.

Goldbach Conjectures [1]

Deducing from Lemma 1, 2 and 4, it follows easily that

Lemma 6. *After applying the Sieve of Eratosthenes, every prime factor less than or equal to $\sqrt{2n}$ can not eliminate all integers in (p, 2n].*

If all integers in (p, 2n] are eliminated, it is impossible and contradicts Lemma 1 and 2.

Let $E(n)$ be Formula (4). It is easily seen that

$$\lim_{n\to\infty}\frac{\pi(2n)-\pi(\sqrt{2n})}{E(n)}=1$$

Lemma 7. *After applying the Sieve of Eratosthenes, every prime factor less than or equal to $\sqrt{2n}$ can not eliminate all number pairs in (p, 2n]. When $2n\to\infty$, Formula (5) $\to\infty$.*

The same proof works for Lemma 7, hence the first Goldbach conjecture is true.

Every odd integer greater than 5 can be a sum of an even integer and 3, every even integer greater than 5 can be a sum of an even integer and 2, hence the second Goldbach conjecture is consequently true.

Conclusion

We conclude from the above that all Goldbach's Conjectures are true.

Appendix

The following codes visualize Formula (4) and $\pi(2n) - \pi(\sqrt{2n})$:

```
EstimatedPrimeCount = Function[n2, Round[(n2 Times @@ ((# - 1)/# &
/@ Table[Prime[n], {n, 1, PrimePi[Sqrt[n2]]}]))] - 1 ]; t1 = Table[
PrimePi[2 n] - PrimePi[Sqrt[2 n]], {n, Prime[2], Prime[100]}]; t2 =
Table[EstimatedPrimeCount[2 n], {n, Prime[2], Prime[100]}]; ListPlot
[{t1, t2}]
```

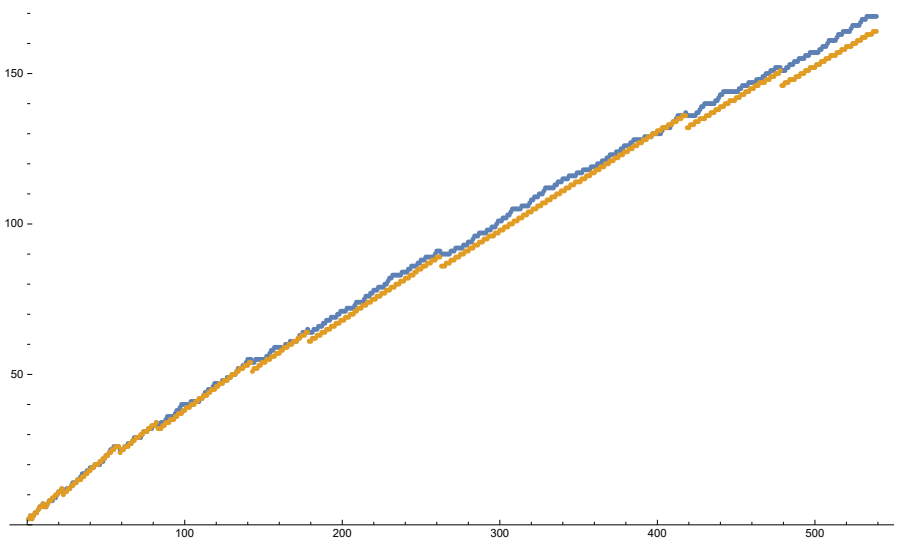

Figure 1:

The following codes visualize Formula (5) and the actual counts of prime pairs:

```
NumberPairs = Function[n2, Module[{n = n2/2}, Map[{n - #, n + #} &,
Range[0, n]]] ]; PrimePairs = Function[n2, Select[NumberPairs[n2],
PrimeQ[#[[1]]] && PrimeQ[#[[2]]] &] ]; LowerBoundofPrimePairCount =
Function[n2, Floor[ (n2/2) 1/ 2 Times @@ ((# - 2)/# & /@ Table[ Prime[
```

```
n ], {n, 2, PrimePi[Sqrt[n2]]}]) ] ]; t1 = Table[Length[PrimePairs[2
n]], {n, Prime[2], Prime[100]}]; t2 = Table[ LowerBoundofPrimePairCount[
2 n], {n, Prime[2], Prime[100]}]; ListPlot[{t1, t2}]
```

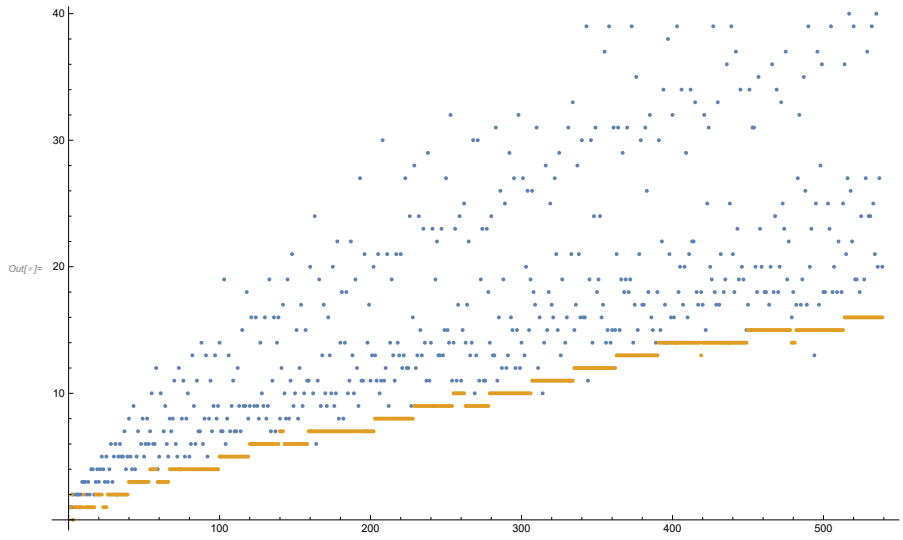

Figure 2:

References

[1] L. E. Dickson. *History of the theory of numbers*. Vol. 1. New York, 1934.

2019-01-27 10:30

Dear Professor Wang,

Acta Mathematica has received your submission:

Date: 26 Jan 2019 18:30 PST
Title: Approximative Lowerbound of Prime Pairs
Author: Zhong Wang
E-mail: n43e120@163.com
Editor: editors
Paper ID: 190126-ZhongWang

and has forwarded it to the Editorial Board. If any of the author information is incorrect or becomes outdated, please let us know.

You will hear back from us at the completion of the editorial process. For general inquiries, send email to
editflow+acta@msp.org
If you encounter software problems such as not being able to view the status page, please inform the technical staff at
editflow@msp.org

You can track the status of your article here:

https://ef.msp.org/status.php?[redacted]

2019-01-29 04:57

Dear Professor Wang,

I regret to inform you that your paper submitted to Acta Mathematica entitled

Approximative Lowerbound of Prime Pairs

is rejected. It does not meet the standards of Acta.

Yours sincerely,
Tobias Ekholm

2019-01-29 08:27

Dear Editors of Acta Mathematica:

I'm an author of the article
Approximative Lowerbound of Prime Pairs
submitted on 26 January 2019.

*** AUTHOR: EDIT AS NEEDED ***
In your last reject email you mentioned "standards of Acta".
Could you kindly tell me what the "standards" explicitly?
For example, please tell me which standard I've broken?
Does the standards have a written form?
So, I can check and fix each of the violation.
Single word makes things very vague!

Thank you,
Zhong Wang

Chapter 14

2019/01/29 Submit to Mathematika

One day later, I emailed Edinburgh. No one replied me. And then I submitted to Mathematika of London Mathematical Society. It lasted for 2 weeks before it was rejected. This time no reason for it.

2019-01-25 15:34 chicken-or-egg-problem

Dear and Respectful Mathematicians of Edinburgh Mathematical Society:

Good day, my name's Zhong Wang, an author of a math paper. I need your attention and perhaps your help or guide.

I can not publish my paper not because of critical logical errors or non-rigorous explanation or poor authoring, but sociological problem, social position discrimination and proof method bias. I am neither an scientist nor mathematician which costs me too much in handling with this system and society. I tried to post to a Journal last year, it cost me 2 months to wait any news, and it turned out be rejected with a reason that due to large pile of paper. I presume that the probability of successful publishing rate is very slim.

I was 21-year-old young boy worked at downtown fast food restaurant when I first came up the basic idea of this paper that was 2001 in which year that a British company donored 1M pounds for whom can solve that problem. I was poor. and living in the bottom of the society, starving at every non-workday.

I could not make any contact with any native professionals with proper methods. nobody replied my emails or letters even today. What I try to do here is I am hoping there are good guys somewhere in God's Kingdom who shares with me more common ground, moral. pursuing truth and rightness rather than evil mocking other's failure or ignore and keep silence when other's right or need help.

I did get some helps, recently I spent money to a editing company after MSRI response my email to encourage me push it further. but the expert with the company refused to cooperate when I ask he/her to endorse me on arXiv which I thanked after contract.

I don't mean to bother anyone's peace if I only have to. It's a chicken-or-egg-problem. can you help me with this?

With best wishes

Sincerely,
Zhong Wang

14.2 Cover Letter

You may expect the solution should be as complex as a higher life form. Sorry, I am providing you a virus. A virus may be simple. But does simple mean stupid? jaguar or virus, who is advanced in evolution? Please be patient while reading a virus. A professional should not have prejudice against a proving method.

2019-01-29 11:01

Dear Professor Wang,

Mathematika has received your submission:

Date: 29 Jan 2019 03:01 GMT
Title: Approximative Lowerbound of Prime Pairs
Author: Zhong Wang
E-mail: n43e120@163.com
Editor: Alex Sobolev
Paper ID: 190129-ZhongWang

and has forwarded it to the Editorial Board. If any of the author information is incorrect or becomes outdated, please let us know.

You will hear back from us at the completion of the editorial process. For general inquiries, send email to
mathematika@lms.ac.uk
If you encounter software problems such as not being able to view the status page, please inform the technical staff at
ef-lms@msp.org

You can track the status of your article here:

https://edf.lms.ac.uk/ef/status.php?[redacted]

2019-02-09 18:21

Dear Professor Wang,

Approximative Lowerbound of Prime Pairs
by Zhong Wang

Thank you for submitting your article for
possible publication in Mathematika.

On behalf of the Editorial Board, I regret to inform you that
we shall not be able to publish your paper. We are sorry that we have
had to disappoint you on this occasion, but we thank you for
considering publishing with Mathematika.

Yours sincerely,

Alexander V. Sobolev

2019-02-09 19:52

Dear Editors of Mathematika:

I'm an author of the article
Approximative Lowerbound of Prime Pairs
submitted on 29 January 2019.

I am definitely unhappy to see this consequence if I knew it will come to end like this sad result.

Could you pleased share more information about the rejection, for example,
1 what is the reason which not mentioned,
2 what happened during these 10 work days how do you make the rejection decision
and 3 why does it take so long to have this?

This paper has been first created at year 2001 and it has last for 18 years by now. At that time, I was 21-year-old young boy worked at downtown fast food restaurant when I first came up the basic idea of this paper that was 2001 in which year that a British company donored 1M pounds for whom can solve that problem. I was poor. and living in the bottom of the society, starving at every non-workday.

I could not make any contact with any native professionals with proper methods. nobody replied my emails or letters even today. What I try to do here is I am hoping there are good guys somewhere in God's Kingdom who shares with me more common ground, moral. pursuing truth and rightness rather than evil mocking other's failure or ignore and keep silence when other's right or need help.

I did get some helps, recently I spent about 600USD to a editing company after MSRI response me a email to encourage me push it further. but I fail to persuade the expert with the company to cooperate when I ask he/her to endorse me on arXiv which I thanked he/her after the end. (by the way he/her said I was using possibility to solve which I never did)

Please understand although I am patient but I am very serious at this. This is not a single stupid paper. It has been about what is truth and rightness in the world. I must go get bottom of it.

If I could not publish my paper for a reason that is not critical logical errors or non-rigorous explanation or poor authoring. What I see the world is as bad as hell. This is

crisis of humankind. I know I know the world is not perfect, in fact, way far from perfect. But, I hope I can count on you because you are honest gentlemen and ladies. Not for me, but for the sake of God, the sake of truth and rightness.

Please stand by the side of honesty, kindness, God will thank you.
Thank you,
Zhong Wang

(btw, I am not a christian, but just live like one since born. it seems like it will make me a saint or something. I just want to publish a paper, that's all. please help to not let this issue becomes a mauvais drama. thank you.)

Chapter 15

2019/02/11 Write This book

This book was started to write at February 11, 2019. Thank God's plan, I have to write this book as history.

Postscript

Like dark matters in physical universe, there are a lot of hidden dimensions in the world. Visible matters are just the tip of an iceberg or a fossil. Many more critical matters have never been spoken.

Rumors and jokes, lingoes, hypothetical and confidential dimensions have always been imaginary part. The real part of story is always I am just pulling a thousands tons train forward alone and everybody on the train is sitting silently watching or staring at me. When I toasted myself a drink, I had had a forefeeling that this issue would go down silently. Today it is true.

Ideally, a theory should be openly, honestly discussed and opinions should be exchanged quickly. If it were right, admit it. If it were wrong, tell what's wrong. If it were imperfect somewhere, tell where to improve. Really, subjecting to inexplicable hidden social factors, I have only gotten rejection for all various and intriguing reasons and an unprofessional false review as communication.

Either right or wrong, people should not be keeping silent, ignoring me or even lying to get rid of my case at first place. The on-going contradiction and abnormality are making me confused.

Many more subsequent side social phenomenons and nuances show me that my proof is quite popular, has gotten huge amount of attention, even some academics consider it. e.g. My paper has ever been at the top of Google search results for some time. Someone edited the entry of Goldbach Conjecture on baike.baidu.com with it many years ago. I see it is discussed in a forum. The web is not a friendly space, or not at all. If anyone said anything wrong or misbehaved, net users will go attack. It is the elephant in the room. Everyone knows it, but no acknowledging at all.

Academics or authorities are so cool with it, prejudicially ignoring all my emails, delaying and rejecting my paper publishing. I use the word "shelved" to describe their attitude towards my proof which is too short and simple to be falsified. But at same time they simply don't want to acknowledge it for an inexplicable reason. So, they shelve my theory, which means they don't touch it or see it. Like many cases in the history, a theory would be begun to realize and discuss after its author was dead. When you see this, I might have been dead. If I haven't die, spread my story to everybody that there is a nasty social bug needs to be fixed imminently.

I have been living at bottom of the society all my life. I haven't had money.

I haven't had anything good a normal person should have. My life is an empty bottle. All my stories happened in chaotic, full of lies, violence. It is poor, vicious, hostile and complicated, cold, dark, crazy, cruel, absurd or dramatic. In other words it is a non-humanized, anti-humanized environment which is always sucking good comedy from you and dumping waste tragedy into you.

But, supernaturally, the basic idea of proof just came up at my 20, the hardest time in my life. I have always been learning everything by myself. Now I am a full-fledged adult with transcendent and enlightenment personality with faithful, responsible, love, kind, wise altogether as humanity in practice.

My child, I hope you could get something. Every story in the book is 100% authentic, truthfully accurately depicted and untold but here. May the world be less evil, more kind, less tragedy, more comedy, humanized and civilized. May humanity be with you!