

# Mingjun Gao

Personal Website: <https://jadongao.netlify.app>

Email: [jadongaoca@gmail.com](mailto:jadongaoca@gmail.com)

## EDUCATION

---

Shanghai Starriver Bilingual School

2020-2024

### Self-Learning

Feynman's Lectures Vol I & II

Physics by Resnick, Halliday, and Krane

### Online College-level Courses Taken

Harvard Extension School - Multivariable Calculus Sep 2023 - Dec 2023

Georgia Technology @edX - Linear Algebra Sep 2023 - Present

MIT Open Courseware - Quantum Mechanics 8.04 Jun 2022 - Aug 2022

Stanford University @Coursera - Machine Learning Mar 2022 - Jun 2022

## HONORS AND AWARDS

---

**PUPC** (Physics Unlimited Premier Competition), Grade 11  
Global Rank 9, China Rank 2(tie)  
[http://physicsu.org/premier/pupc\\_2022\\_results-by-score.pdf](http://physicsu.org/premier/pupc_2022_results-by-score.pdf)

**PUEC** (Physics Unlimited Explorer Competition), Grade 11  
Global Rank 5, China Rank 1st(tie), Team Leader  
[http://physicsu.org/explorer/2023\\_Explorer\\_Scores.pdf](http://physicsu.org/explorer/2023_Explorer_Scores.pdf)

**BPHO** (British Physics Olympiad) Global Gold Grade 11

**CAP** (Canadian Association of Physicists High School Prize Exam), China Gold Grade 11

**Physics Bowl D1** 2022, Global rank 38/~4000 Grade 10

**Physics Bowl D2** 2023, China Gold Grade 11

**AMC** (American Math Competition) **12**, Grade 11  
AIME Qualifier

<b>USACO</b> (USA Computing Olympiad), Gold	Grade 11
<b>Basketball Match in Minhang District</b> , Tournament, Rank 2/20	Grade 10
<b>Basketball Match U15 of SSSA</b> (Shanghai Schools Sports Association), Tournament	Grade 9
<b>Youth Science and Technology Innovation Competition 2021</b> , the 3 <sup>rd</sup> Award	Grade 9
<b>Clubs Fairs</b> , the Excellent Club Award to the City Explore Club	Grade 11

## ACTIVITIES

---

### Community Service (Volunteer)

#### **Tutoring at Schoolhouse.world**

Nov 2022-present

Physics Tutor & Moderator, AI Specialist, Silver tutor qualifier

Tutored 60+ sessions to 70 learners from 16 countries; tutored 80 hours by the end of Nov of 2023; initiated & held "problem of the week" & club gatherings; subworld grew to 15000+ Learners

Course Tutored: AP Physics 1, AP Physics C, Physics Competition & Calculus

Schoolhouse Profile:

<https://schoolhouse.world/u/155443>

Schoolhouse Transcript:

<https://drive.google.com/file/d/1GOTuF1weEV6JFKbB7ffdL9gXLVRzrjqH/view?usp=sharing>

### Science Popularization

#### **TEDx Talk - The Story of Nothing**

Grade 11, 2023

To discuss the "nothing" concept from the "vacuum" in physics to the nothing in life, nothing is really nothing.

Talk Video: <https://www.youtube.com/watch?v=G4UNrR3NzR4>

Talk Transcript: <https://jadongao.netlify.app/post/the-story-of-nothing/>

#### **Musical Chord and the Fourier Transform**

Grade 11, 2023

It was highly enlightening to see a connection between music and math. Here, I dotted down how powerful the Fourier transform was to identify musical chords. I also made a Fourier analysis machine using LEGO that mimics how the real deal was made a century ago. Works like magic :).

Article: <https://jadongao.netlify.app/post/music-and-fourier/>

Machine Article: <https://jadongao.netlify.app/post/lego-fourier/>

## "Technovator" Initiative

### AI Physics Tutor

May 2023-present

I found sometimes the learner cannot get the timely guidance from the tutor due to the time difference, so I'd like to develop an AI tutor system which can help tutoring when the tutor is absent.

GitHub Repository: <https://github.com/jadongao/AI-Tutor-Physics>

Website Link: <https://ai-tutor-physics.vercel.app/> (password: aitutor23)

### A Low Resistance Mask with Fan

Grade 10, 2021

I hope to design a low resistance mask that can be carried around. Low cost, suitable for ordinary people rather than specific patients.

Article: <https://jadongao.netlify.app/post/mask-system/>

### Basketball Goal Detection App

Grade 9, 2020

During the first lockdown in 2020, it was impossible for our school's basketball team to train together. I developed an app that can identify basketball goals, a way to keep track of each player's training status and preserve their enthusiasm to practice individually. It remains a go-to tool for many players on the team.

Article: <https://jadongao.netlify.app/post/basketball-scoring/>

## Research Project

### Research With Professor Wang Hui at SJTU

Grade 10,11,12, Oct 2021-present

I was inspired to dig deeper into the field of semiconductors because of its significant impact on modern electronics and a wide range of applications.

Article: *Perturbation Theory: Hydrogen and Alkali Atoms in Constant E-Field*

<https://jadongao.netlify.app/post/photo-varistor/>

### Study Quantum Physics with Professor Ramesh Adhikari at Colgate University

Grade 11, Mar 2023-Jul 2023

The peculiar principles of quantum physics have always sparked my critical lens of the world - to question every fact given.

Article: *Perturbation Theory: Hydrogen and Alkali Atoms in Constant E-Field*

<https://jadongao.netlify.app/post/perturbation-theory/>

## Publications

**Essay "A Day in Hospital"**, published on the Journal "Echo" of our Shanghai Starriver Bilingual School.

Grade 10, 2022

<https://drive.google.com/file/d/1MAcSHqImTPyy2yfyAHWU8MD9xAOh2M7y/view?usp=sharing>

**"Perturbation Theory: Hydrogen and Alkali Atoms in Constant E-Field"** which is in the field of quantum physics, published on the "VERITAS" academic journal of our Shanghai Starriver Bilingual School.

Grade 12, 2023

[https://drive.google.com/file/d/1472NdBU2eqjCHwwYPCPT7U\\_JBsGkdaNF/view?usp=sharing](https://drive.google.com/file/d/1472NdBU2eqjCHwwYPCPT7U_JBsGkdaNF/view?usp=sharing)

## Family Responsibilities

### **Hair dressing for myself and family**

### **Repairing of household goods and home electronics**

Repairing the computer charger for the neighbor

Repairing the igniter of the cooker

Repairing the desk lamp

Repairing the mobile phone charger

### **Cooking for my family**

Be good at frying beef steak and frying egg

### **Help mom for her sports to improve her insomnia**

## Art

### **The Drama Club**

Grade 10-11, Sep 2021-2023

Played Nick in the play "Cut"

When on the stage and the spotlight, I felt from Panic to silent to the enjoy of the process.

## Clubs

### **Co-Founder, Urban Culture Club**

Grade 10-12, Sep 2021-present

The co-founder of the club

Interviewed Shanghai store owners to voice out their difficulties during the COVID lockdown; organized weekly "city walks"; grew from 2 to 16 members

## Sports

### **School Varsity Basketball Team**

2014 - present

Point Guard/Vice-Captain, played 8+ years; assisted coach's training; stayed after each training to help freshman players enhance their skills; made lifelong friends.

### **School Varsity Soccer Team**

2014 - present

As the midfielder to control the ball on own side, intercept the opponents for the ball, organize the offence to score goals.

## Further Physics Team

Grade 11, 2023

As a member of the further physics team, I call for 4 members to attend the PUEC (Physics Unlimited Explorer Competition), which is a team-based, collaborative open-ended assignment that takes place every spring. we studied together about the assignment and finally we ranked global 5 and China 1(tie). This is the 1<sup>st</sup> time of our school to take part in the PUEC. We all are interested this competition and I really appreciate the collaboration from my team members.

## Subject Representative of Physics

Grade 9, 2020-2021

To help teacher to collect and hand out the homework of Physics.

To answer the Physics questions from classmates