

Mengzhen (August) Liu

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EDUCATION

University of Cambridge, Cambridge, UK

- Undergraduate Course: Mathematical Tripos Sep 2018 – Present
- Currently in Part IB of Three-Year Course at Trinity Hall
- Courses Taken:
 - IA: Differential Equations, Vectors and Matrices, Groups, Numbers and Sets, Probability, Analysis I, Vector Calculus, Dynamics and Relativity.
 - IB: Markov Chains, Quantum Mechanics, Linear Algebra, Methods, Analysis and Topology, Groups, Rings and Modules, Geometry, Statistics, Numerical Analysis, Complex Analysis, Variational Principles, Optimisation.
 - II: Galois Theory, Graph Theory.

Beijing National Day School, Beijing, China.

- International Department, International Baccalaureate Diploma Program Sep 2016 – Jun 2018
 - Higher Level Courses: Mathematics(7), Further Mathematics(7), Physics(7).
 - Standard Level Courses: Chinese A(7), English A(6), Economics(6).
 - Biligual Diploma (English, Chinese) with Total Score 42/45.

RESEARCH EXPERIENCE

Fields Undergraduate Summer Research Program Toronto, Canada (online) Jul 2020 – Aug 2020

- 2 months of research under supervisors Ada Chan and Hanmeng Zhan from York University.
- Topic: Continuous Time Laplacian Quantum Walk, specifically Laplacian Fractional Revival.
- Papers resulting from this:
 - Laplacian Fractional Revival on Graphs. Paper on arxiv [here](#).
 - Laplacian Pretty Good Fractional Revival. Paper on arxiv [here](#).

Budapest Semester in Mathematics, Budapest, Hungary.

- Participant Jun 2019 – Aug 2019
 - Eight weeks of studying and research.
 - Courses taken: Advanced Combinatorics (A+), Graph Theory (A+).
 - Research: Explicit Burgess Bound for Character Sum under Composite Moduli with Prof. Maga Peter. Paper on arxiv [here](#).

Ross Mathematics Program, Ohio State University, OH, United States of America.

- Participant Jun 2018 – Jul 2018
 - Six-week intense program on elementary number theory.
 - Starting from axioms upto contents such as Quadratic Reciprocity and Polynomial Rings.

PUBLICATIONS

- **Laplacian Fractional Revival on Graphs**
Accepted by *Electronic Journal of Combinatorics*. With Ada Chan, Bobae Johnson, Malena Schmidt, Zhanghan Yin, Hanmeng Zhan. [arxiv](#)
- **Laplacian Pretty Good Fractional Revival**
Preprint. With Ada Chan, Bobae Johnson, Malena Schmidt, Zhanghan Yin, Hanmeng Zhan. [arxiv](#)
- **Explicit Burgess Bound for Composite Moduli**
Accepted by *International Journal of Number Theory*. With Niraek Jain-Sharma, Tanmay Khale. [arxiv](#)

AWARDS & SCHOLARSHIPS

- **Election to Scholarship**, Trinity Hall, University of Cambridge Jun 2019
For outstanding results in Part IA of the Mathematical Tripos, elected as a scholar at Trinity Hall, University of Cambridge.
- **First Class Distinction**, University of Cambridge Jun 2019
For results in the first year of my studies in Mathematical Tripos at the University of Cambridge, ranking No. 3 out of 232 students.
- **Top Scholarship**, First Prize, Beijing National Day School Dec 2018
For outstanding graduation results, of 100000 RMB.
- **Mathematical Contest of Modeling, 2-Time Meritorious Winner** Feb 2017, Feb 2018
Consortium for Mathematics and Its Applications (COMAP)
Two-Time Winner of Meritorious Winner, papers available here at [pdf2017](#) and [pdf2018](#).

- **International Mathematical Modeling Challenge, 2-Time Outstanding Award** Apr 2016, Apr 2017
COMAP and NeoUnion ESC Organization
Top-Two Place in Mainland China Division for 2 Consecutive Years, papers available here at [pdf2016](#) and [pdf2017](#).
- **Hope Scholarship**, First Prize, Beijing National Day School Sep 2016
For topping the grade in the entrance examination, of 90000 RMB.

**CAMPUS
ACTIVITIES**

Mathematical Modeling Association, Beijing National Day School

- **President** Jan 2017 – Jun 2018
 - President of Association for one and a half year.
 - Led members take hosted modeling lectures, participate in competitions, hold seminars, and cooperate with outside labs and companies.

**VOLUNTEER
WORK**

STIMULUS volunteering, Cambridgeshire, United Kingdom.

- **Participant** Dec 2018
 - Volunteering at Coleridge Community College, tutoring one hour per week for an entire semester.

LANGUAGES

- English. Chinese.

SKILLS

\TeX , \LaTeX , \XyLaTeX , MATLAB, Python.

INTERESTS

Maths, Tennis, Music, Food.

REFERENCES

- **Professor Jack Thorne**
Professor of Mathematics
DPMMS, University of Cambridge
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- **Dr Ronald Reid-Edwards**
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