Qixuan Wang

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EDUCATION

Duke Kunshan University **Kunshan, China**
Bachelor of Science in Applied Mathematics and Computational Science September 2020 – May 2024
- **Combined Cumulative GPA:** 3.637/4.0 **(**Dean's List: Fall 2020), **Major GPA:** 3.765/4.0

Duke University **Durham, USA**
Exchange Program January 2023 – May 2023
- **GPA:** 4.0/4.0 **(**Dean's List with Distinction: Spring 2023)

PUBLICATIONS

- Italo Simonelli and **Qixuan Wang**. An Elementary Proof of the Law of Iterated Logarithm for Minima and New Extensions of the Borel-Cantelli Lemma. *Under Review*, 2022.
  Available at SSRN**;** listed on SSRN's Top Ten download list for Probability & Statistics eJournal

RESEARCH EXPERIENCES

Diffusion Probabilistic Models [Code] **Durham, USA**
Supervised by Professor Jian-Guo Liu (Duke University) May 2023 – Present
- Adopted the input perturbation method to the single image generation and proposed an improved version of the single image denoising diffusion model (SinDDM)
- Achieved better generated image quality than the original method and planned to apply the new algorithm to speech synthesis and text generation

The Sunflower Lemma **Kunshan, China**
Supervised by Professor Italo Simonelli June 2022 – December 2022
- Aimed to make an improvement of the existing lower bound for finite delta systems
- Pinpointed and corrected a mistake in a formula for calculating the lower bound in a paper by Harvey L. Abbott and got the correct lower bound in some cases

The Borel-Cantelli Lemma and the Growth Rate of Partial Maxima **Kunshan, China**
Supervised by Professor Italo Simonelli October 2021 – June 2022
- Presented a new, simple proof of the law of iterated logarithm for minima of uniform random variables and proved new extensions of the Borel-Cantelli Lemma
- Published a preprint on SSRN – An Elementary Proof of the Law of Iterated Logarithm for Minima and New Extensions of the Borel-Cantelli Lemma

PROJECTS

Bark Voice Cloning and Voice Cloning for Chinese Speech
- Integrated Bark voice cloning with SambertHifigan for Chinese speech and created an intuitive, easy-to-use user interface [Code] [Demo]
- Received over 1,500 stars on GitHub; one of the Top 20 applications sorted by trending on Hugging Face

ChatGLM2 Voice Cloning
- Enabled users to chat with any character they like in real time using large language models, talking face animation and voice cloning [Code]
- Received over 480 stars on GitHub

Modeling the COVID-19 Epidemic with Ordinary Differential Equations
Supervised by Professor Konstantinos Efstathiou
- Discussed thoroughly the SIR (Susceptible-Infected-Removed) model for the spread of disease and some of its variants in epidemiology [Report] [Slides]
- Combined several variants of the SIR model to get a new model that takes more parameters into account

TALKS

- **The Sunflower Lemma: Understanding Highly Regular Patterns in a Large Uniform Family**
  DKU Discrete Math Seminar
  November 24, 2023 [Recording]

- **The Borel-Cantelli Lemma and the Growth Rate of Partial Maxima**
  DKU Discrete Math Seminar
  March 24, 2023 [Slides]

- **The Probabilistic Method: The Basic Method and the Local Lemma**
  DKU Discrete Math Seminar
  September 23, 2022 [Slides]

TEACHING EXPERIENCES

- Tutor in **Real Analysis** (MATH 308): Spring 2023
- Tutor in **Probability and Statistics** (MATH 206): Spring 2023, Fall 2023
- Tutor in **Probability and Statistics** (MATH 205): Spring 2022, Fall 2022, Spring 2023, Fall 2023
- Tutor in **Introduction to Applied Statistical Methods** (STATS 101): Spring 2022

LEADERSHIP EXPERIENCES & SERVICE

- Founder of United Platform sponsored by DKU Innovation Incubator: From Fall 2021 to Spring 2022 [News]
- Vice President of DKU Soccer Association: From Fall 2021 to Spring 2022 [News]
- Director of Publicity of DKU Soccer Association: Spring 2021 [News]
- Played for DKU Varsity Soccer Team: From Fall 2020 to Fall 2022 [News]

DEMOCRATIZATION OF ARTIFICIAL INTELLIGENCE

- **A content creator**: Made more than **30** videos about how to use various applications of generative AI, such as speech synthesis, stable diffusion, and large language models on bilibili – one of China's most popular video-sharing platforms. My channel now has about **9k** followers, and my videos have over **600k** views in total.
- **Open-source projects**: Built many deep learning applications, all of which are open-source. My GitHub projects have received over **2.2k** stars in total. My speech synthesis project was one of the Top **20** applications sorted by trending on Hugging Face.
- **Entrepreneurship**: Worked on a startup project named TalkTalkAI. My goal is to let everyone enjoy a better life and work more efficiently through human-centered AI. I have discussed my startup project with the partners of two venture capital firms (**Y Combinator China** and Panda Capital) and collaborated with other AI startups actively.

INTERNSHIP

Luoyang Electrical Energy Storage and Transformation System Co., Ltd. **Luoyang, China**
- Participated in the development of a high-energy-density lithium-ion battery system — May 2022 – July 2022
- Worked on designing and testing a wide operating temperature power supply system

Information Technology Department of Innoscience **Suzhou, China**
- Worked on a Python program for yield testing and anomaly detection — July 2022 – August 2022

RELEVANT COURSEWORK

- Relevant courses taken at **Duke Kunshan University**:
  Linear Algebra, Probability and Statistics, Numerical Analysis, ODE and Dynamical Systems, Advanced Introduction to Probability, Partial Differential Equations, Abstract Algebra, Measure and Integration, Deep Learning
- Relevant courses taken at **Duke University**:
  Real Analysis (MATH 431), Statistical Learning and Inference (STATS 432)

TECHNICAL SKILLS

Programming languages: Python, R, Java, Julia, LaTeX, Markdown, Mathematica
Battery engineering: battery management systems, circuit modeling and simulation