

Derek Qin

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EDUCATION

- **California Institute of Technology**, Pasadena, California *Sept 2020 - Present*
 - Bachelor of Science: Computer Science (Machine Learning & Robotics)
 - **Selected Coursework: Passed Placements:** Ma 1c (Multivariable Calculus), Ma 2 (Differential Equations), Ph 1a (Classical Mechanics); **CS:** CS 21 (Decidability and Tractability), CS 38 (Algorithms); **Math:** Ma 6a (Discrete Math), Ma 1b (Linear Algebra, Analytical)

PROJECTS

- **Traffic Signal Control Simulation for Optimization of Vehicle Flow** Plano, Texas
Computer Science & Applied Mathematics *August 2017 - March 2018*
 - Developed a novel signal management algorithm using car volume statistics using Python and Google Maps API, tested on both non-actuated and semi-actuated intersections (18% decrease in wait times)
 - **Awards:** **1st Prize** in Engineering Mechanics, DRSEF; TXSEF Finalist; **3rd Prize** Terracon Consultants Excellence in Engineering; ONR Special Award; AFRL Special Award
- **Phantom Traffic Jam Alleviation Using Networked Autonomous Cars** Plano, Texas
Computer Science & Applied Mathematics *August 2018 - April 2019*
 - Created a novel microscopic traffic model and derived a first-order differential equation to model flow rate and jam dissipation for bilateral and vehicle unit control.
 - **Awards:** **1st Prize** in Mathematics, DRSEF; TXSEF Finalist; Mu Alpha Theta Special Award
- **Surface Stress Development During Nanopatterning** Boston University, MA
Materials Science, Computer Science, & Physics *June 2019 - Present*
 - Selected for Research in Science & Engineering (RISE) Program
 - Analyzed self-organizing patterns on Si in ultra-high vacuum bombarded by Ar⁺ using AFM imaging.
 - Developed computer vision analysis software using to speed up MOSS analysis and improve precision
 - *Mentors:* Prof. Karl Ludwig, Peco Myint
 - **Awards:** **1st Prize** in Physics, DRSEF; TXSEF Finalist; ONR Special Award; AFRL Special Award

EXPERIENCE AND ACTIVITIES

- **QuizBowl**, Plano West Senior High Plano, Texas
Co-Captain, Co-President *Aug 2018 - May 2020*
 - Led team to NAQT HSNCT and NAC Championship Finals in first year of QuizBowl
- **Association for Young Scientists and Innovators** Plano, Texas
Vice President, Co-founder *May 2019 - September 2020*
 - Managed membership information and communication with over 200 science fair students
 - Organized AYSI Summer Coding Institute, which taught over 300 middle and high school students essential skills in MIT App Inventor and Artificial Intelligence

AWARDS AND ACHIEVEMENTS

- USA Physics Olympiad, Honorable Mention (National Top 200 Individuals) (2019)
- Harvard-MIT Mathematics Tournament, Team Round, 10th Place (2018)
- 5x American Invitational Mathematics Exam (AIME) Qualifier (2015, 2016, 2017, 2018, 2019)
- **Research Awards:** See Projects Section

SKILLS

- **Languages:** Fluent in English and Mandarin Chinese
- **Programming Languages**
 - C/C++ , Java, Python, HTML/CSS, L^AT_EX, Matlab, Octave
 - Tensorflow, Keras, Scikit-learn, NumPy