David Fan

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Interests

Computational biology/bioinformatics; genomics + biotech; big data analytics; data mining; pharmacology; cancer immunology; alternative energy; materials science; health management

Education

Princeton University 2015 - 2019
B.S.E in Computer Science (tentative) with Certificate in Quantitative and Computational Biology

Montgomery High School (Skillman, NJ) 2011 - 2015
GPA: 98.57, SAT: 2390 Graduated with High Honors

Work Experience

5eTEK Intern
Skillman, NJ 2015 – Present
Helped develop circuitry kits and learning modules involving transistors and diodes as well as write a website for showcasing community project submissions.

Yu's Elite Education Instructor
Bridgewater, NJ Spring 2015
Taught a fast-paced introductory Science Olympiad class for rising middle schoolers. Gave students exposure to 8 competition events. Developed all learning materials and lesson plans myself.

Publications

Heart-Specific Rpd3 Downregulation Enhances Cardiac Function And Stress Resistance May 2015
under review at *Aging*

Topological defects as relics of emergent continuous symmetry and Higgs condensation of disorder in ferroelectrics Nov/Dec. 2014 (online/print)
Nature Physics

Research

Rutgers New Jersey Medical School - Partners in Science Fellow Paid Intern
Newark, NJ Summer 2014
Researched genetic mechanisms of aging in Drosophila fruit flies, specifically the effects of the RasGTP-Raf-MEK-ERK signaling pathway on organismal and organ senescence. Conducted lifespan and stress (starvation, oxidative and heat) assays on flies with transgenes expressing varied levels of Rpd3 protein in the heart tissue. I also conducted heartbeat measurements on flies throughout various stages in their lifespan to analyze heart-function decline with age. Coauthor of paper submitted to *Aging Cell*.

New Jersey Governor's School of Engineering and Technology
July 2014
One of 80 students across the state accepted into the Governor's School of Engineering Program (four weeks in summer of 2014). My four person research-group designed and built a shoebox-sized car that runs autonomously using chemical reactions. Only uses cheap, widely accessible household products. Seminars taken: Modern Physics, Intro to Biomechanics, Math Behind the Machine, Pharmaceutical Engineering, NXT Robots

Rutgers University Department of Physics - Partners in Science Fellow Paid Intern
Piscataway, NJ Summer 2013
Explored symmetry-breaking phase transitions in multiferroic materials (i.e. rare-earth hexagonal manganites). Polished and depth-profiled these materials to image their topological defect distribution. This work led to a paper published in *Nature Physics*. As a side project I also conducted high-temperature resistivity measurements on novel rare-earth copper titanates using a two-probe method to characterize their ferroelectric transition temperature.

Qualifications

Programming Languages: Java, Python, Javascript, HTML, CSS, (basic) iOS and Android dev.
Lab Skills: Crystal surface depth-profiling, High-Temperature Resistivity measurements, Gel Electrophoresis, Drosophila maintenance

Activities

Science Olympiad (Team Captain + Tournament Director) 2009-2015
Won 31 career-total tournament medals in various Regional and State level competitions, including 4 State gold medals (in Towers, Elastic Launched Gliders[2x] and Cell Biology) as well as 2 State silver medals (in Water Quality both times). Under my leadership, the team expanded from 20 to over 70 active members. I also took the initiative to organize my high schools first SciOly invitational, the Cougar Invitational, which was also New Jerseys first). I was the tournament director and volunteer coordinator.

Montgomery Against Cancer (Cofounder) 2013-2015
I cofounded a group that conducts informational campaigns to educate high school students about causes and treatments for cancer, and fundraises money for cancer research. In two years we raised over 4000 dollars.

Montgomery High School STEM Board (Cofounder) 2014-2015
To get more students involved and interested in STEM, I and other students from Science Olympiad created a body that exclusively conducts STEM outreach. Among other initiatives, weve hosted guest speaker events inviting local university professors to speak about their research, and created a website with consolidated research and competition opportunities for Montgomery students.

Chinese Tiger Newspaper (Editor-in-chief) 2011-2015
For the local Saturday Chinese School, I run advertisements to solicit student articles, organize fundraisers and create each weeks column for publication. We have over 120 publications in Qiao Bao, or China Press USA-NJ.

Abbreviated Honors and Awards

Intel STS Competition Semifinalist January 2015
Intel Science Talent Search is the nationś most prestigious high school research competition. Submitted self-written and editted 18 page manuscript of my work from summer 2014.

USA Biology Olympiad Semifinalist March 2015
USABO is the USA's national biology competition, a three stage qualification process to represent the USA at the International Biology Olympiad. Semifinal qualifiers (approximately the top 500) are eligible to take the second round USABO exam.

National Merit Scholarship Winner Collegeboard - May 2015
Recognized for scoring in the top 1 percent of nearly 1.5 million students nationwide on the 2013 NMSC PSAT Exam (237 out of a perfect score of 240). Became a semifinalist, finalist, and eventually winner (top 0.5 percent of all students nationwide) in the National Merit Scholarship competition.

NJ Governor's School of Engineering and Technology Scholar 2014
One of 80 students statewide accepted into program.

New Jersey All-State Band Member 2014-2015
Auditioned as high as 3rd chair clarinet overall in the Symphonic Band

AXA Achievement Community Scholarship May 2015
Recognized by AXA for my work with Monty Against Cancer

National AP Scholar July 2014
Scored a perfect score of 5 in eight AP exams