Ozan Kaan Kayaalp

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for updates, see *http://kaan.kayaalp.us*

Education—curricular

2017–date **Mathematics, Science, Computer Science Magnet Program**
Montgomery Blair High School, Silver Spring, Maryland
Current Grade: 12, Expected graduation: June 2021
GPA = 3.92, weighted GPA = 4.76

2019 **Computer Science (visiting undergraduate in Summer Quarter)**
Stanford University, Stanford, California
CS 103 Mathematical Foundations of Computing (Excellent, 5 credits)
CME 108 Introduction to Scientific Computing (Satisfactory, 3 credits)

2016–17 **Magnet Functions A/B**, an accelerated precalculus course
Montgomery Blair High School, Silver Spring, Maryland

2014–17 **Mathematics, Science, Computer Science Magnet Program**
Takoma Park Middle School, Silver Spring, Maryland

Publications

2021 Kayaalp, O.K. "**Learning optimal Bayesian prior probabilities from data**," *Machine Learning*, submitted. [*https://arxiv.org/abs/2101.00672*]

2017 Kayaalp, K. "**The Time in the Breeze**," a poem. *TPMS Journal, Literature and Art Magazine*:2(3).

Internship

8/2020–date **George Mason University** Volgenau School of Engineering, Fairfax, Virginia
Project Title: Improving Wikipedia via machine learning and NLP
Mentor: Dr. Özlem Uzuner, Chair, Department of Information Sciences and Technology

Standardized Test Results

10/2020 **SAT Subject Test (Physics)** Score = 800

09/2020 **SAT** Score = 1550 (ERW 750, Math 800)

10/2019 **PSAT/NMSQT** Score = 1510 (NMSC Selection Index 226; 99th percentile)

05/2019 **AP Computer Science A** Score = 5

05/2019 **AP US Government and Politics** Score = 5

03/2019 **MATH 241 Multivariable Calculus (University of Maryland, College Park)** Score = A+

05/2018 **AP Calculus BC** Score = 5

06/2017 **SAT Subject Test (Mathematics Level 2)** Score = 800

02/2016 **ACT** Mathematics Score = 35

Scholarships

2017 **Oxbridge Academic Programs** Exceptional Merit Scholarship

2016 **University of Maryland** One Course Scholarship

Academic Awards (selected)

2021 **National Merit Scholar Finalist** (National Level)

2019 **AP Scholar Award** (National Level)

Academic Awards (*selected*), *cont'd*

2017 **Broadcom MASTERS**, **Society for Science & the Public** (National Level)
Selected into the group of top 300 students from 6,000 nominees throughout the U.S

2017 **Society for Science & the Public alumnus** (National Level)

2017 **Winner of the Subject Prize in Math and Nature** Cambridge Prep (School Level)

2017 **Star Student Award** Takoma Park Middle School (School Level)

2016 **International Talent Search, High Honors** The Johns Hopkins Center for Talented Youth (International Level)

Extracurricular Projects & Awards

Writing Award

2017 **Gold Key for Excellence in Writing** for personal essay: "From One Place to Another"
The Scholastic Art & Writing Awards of 2017 (State Level)

Research & Science Projects & Awards

2019 **An analysis of the effects of swarm intelligence algorithm hybridization**
Swarm Intelligence implemented in Python [*http://kaan.kayaalp.us/SI.jpg*]

Award
Aerospace Corporations, Robert H. Herndon Science Award, Honorable Mention

2017 **Optimizing policies of a two-player card game using reinforcement learning**
Machine Learning implemented in Python [*http://kaan.kayaalp.us/RL.jpg*]

Awards
Montgomery Science Fair, **1st Place in Computer Science & Mathematics**
Office of Naval Research, Naval Science Award
Rockville Science Center, Certificate of Excellence in Communications of Science, 3rd place
Aerospace Corporations, Robert H. Herndon Science Award, Honorable Mention

2016 **A mathematical model of the card game, Magic: The Gathering**
Parameter optimization using Monte Carlo simulation with Python [*http://kaan.kayaalp.us/MTG.jpg*]

Awards
Montgomery Science Fair, **3rd Place in Computer Science & Mathematics**
Rockville Science Center, Certificate of Excellence in Communications of Science, 2nd place
Aerospace Corporations, Robert H. Herndon Science Award, Honorable Mention

Education—extracurricular

Summer Program

2017 **Cambridge Prep, Oxbridge Academic Programs** University of Cambridge, UK
Major: Math and Nature Minor: Public Speaking

Writing

2016–17 **Crafting the Essay**, challenge level: College Freshman
The Johns Hopkins Center for Talented Youth, Baltimore, MD

Education — extracurricular, cont'd

Guitar

2017–date **Classical Guitar**, private studies, instructor: Dr. Matt Palmer
Matt Palmer Studio, Bowie, Maryland

2013–17 **Classical Guitar Program**, private studies, instructor: Andy Mitchell
Levine School of Music, The Music Center at Strathmore, N Bethesda, Maryland

2015–16 **Advanced Guitar Orchestra**, instructor: Risa Carlson
Levine School of Music, Washington, D.C.

Computing

2014 **Intro to Computer Science**, Udacity

2014 **Introduction to Computer Science & Programming Using Python**, MITx 6.00.1

2015 **Introduction to Computational Thinking and Data Science**, MITx 6.00.2

Activities — extracurricular

Service & Volunteering

2018 **Apprenticeship at KID Museum**
KID Museum is a non-profit organization with the aim to raise intelligent and creative kids in a fun and open environment. Responsibilities included

- Designing devices to float in a wind tube,
- Designing tube structure through which balls can roll, and
- Designing and constructing electrical circuits by soldering wires

2016–17 **Maker's Fair for KID Museum**
Worked during the summer period, assisted the staff and participants

Clubs

2019–date **Quantum Computing Club** (Cofounder/Copresident), Montgomery Blair High School

2017–date **Physics Club**, Montgomery Blair High School

2017–date **Math Club**, Montgomery Blair High School

2017–18 **Engineers' Guild Club**, Montgomery Blair High School

2014–17 **Math Club**, Takoma Park Middle School

Guitar

2018 Eastern Shore Guitar Festival, Youth Competition **(2nd Prize in Division I)**

2017 Workshop, Classical Guitar by Gaëlle Solal

2017 Beatty Classical Guitar Competition

2017 Master Class by Meng Su

2016 Workshop, Flamenco Guitar by Marija Temo

2016 Master Class by Dr. Matt Palmer

2016 Master Class with Levine Advanced Guitar Orchestra by Meng Su

American Math Competition

2017 **AMC 10A** Achievement Roll

2016 **AMC 10A** Achievement Roll

2016 **AMC 8** Distinguished Honor Roll (top 1%)

Skills

Computing

Concepts & Methods (self-taught, hands-on learning)

Concurrent Programming (threading, multiprocessing, distributed computing)
Artificial Intelligence (incl. swarm intelligence)
Machine Learning (reinforcement learning, naïve Bayes, RNN, deep learning)
Natural Language Processing (incl. learning word embeddings from text)
Quantum Computing

Programming Languages (mostly self-taught)

Python (Excellent), **Java** (Good), **C++** (Good), **JavaScript** (Good), **Matlab** (Good), **Regular Expressions** (Excellent)

Applications & Scientific Programming Libraries (self-taught, except Autodesk)

Scikit-Learn, **SpaCy**, **NumPy**, **Matplotlib**, **Tensorflow**, **Keras**, **Autodesk Inventor**

Integrated Design Environments (self-taught, except Eclipse)

Jupyter Notebooks, **Visual Studio**, **Eclipse**, **Komodo**

Network and Cybersecurity

Network and Internet protocols; protecting networks and services from attacks; SQL injections; cryptography; cloud computing; penetration testing; intrusion detection, attack analysis and computer forensics; web exploits; ethical hacking

Operating Systems (self-taught)

Linux/bash/vim, **Windows**/PowerShell, **macOS**

Teaching **Peers**: in my high school (quantum computing), in Cambridge Prep (calculus)
Elementary school kids: in KID Museum (design and innovation)

Languages **English** (native), **Turkish** (fluent, 17 years), **Spanish** (8 years)

Sport **Aikido** (brown belt) 2015–date

Hobbies **Reading** (science fiction & fantasy), **listening music**, **board games**

Praises[*]

He is not only an academic star but he rises above most other academic stars because of his amazing attitude, superb leadership skills, and general maturity. His kindness towards other is unmatched… Kaan does not hesitate to take on solving challenging problems. He is incredibly cooperative and responsible… He is a real special young man and is destined to do great things in life.

–Bryan Goehring, Science Teacher

You are brilliant, but most importantly kind. Those two don't always get synced up in one person.

– Carly E. Moore, AP English Language and Composition Teacher

Ozan was one of the best students I have ever had. His mathematical skills [in August 2017] *are comparable to the ones found on the first years of a University degree in Mathematics.*

–Angel Garcia, Instructor (Cambridge Prep)

[*] Letters are available upon request

Kaan is spectacularly bright ... His extensive vocabulary and skills of argumentation guarantee that his speeches are always interesting and well crafted.

– Abigail Branford, Instructor (Cambridge Prep)

Kaan, you have a mature writing voice with an impressive vocabulary and a flare for descriptive language.

– Diana R. Wallach, Instructor (Center for Talented Youth)

Kaan Kayaalp is not only a fine student and musician, he is also an active listener, a keen thinker, and caring person ... He is flexible and patient with others and knows how to give and take constructive feedback. He is a joy to work with and is respected and well-liked by both his teachers and his peers.

– Teachers on the Eighth Grade (from the Star Student Award)

[H]e has shown outstanding critical thinking skills and has progressed at a much faster rate than most other students—to the degree that I would consider his advancement extraordinarily gifted.

– Andy Mitchell, Composer, Guitar Instructor

His playing has reached a level that is unusually high for the amount of time he has been studying, which is quite impressive.

– Risa Carlson, Chair, Guitar Department, Instructor