Trenton Blitz Bricken

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Education

Duke University - Durham, North Carolina, 2016 - 2020 (Undergraduate)

- Duke and UNC Robertson Scholar. Merit scholarship with a focus on leadership. Includes full funding of all university expenses for four years, including summer experiences
- Majoring in “Minds and Machines: Biological and Artificial Intelligence”, a self-made ‘Program II’ major covering Computer Science, Neuroscience, Statistics and Biology
- Current cumulative GPA overall: 3.775, GPA in major: 3.781, taken 7 graduate classes, featured four times on the Dean’s List

Eton College - Windsor, England, 2011 - 2016 (Secondary school)

- A2 subjects and results: A* Economics, A Politics, A Maths, 5 Computer Science AP (self-taught)

Research and Work Experience

Dr. Debora Marks Lab - Undergraduate Researcher, Harvard Medical School, Systems Biology, May 2019 - Present

- IARPA FunGCAT Project - identifying novel viral genes that suppress host immune response
  - Built an image analysis pipeline to go from high-throughput fluorescent microscopy images to classifying positive and negative results across a number of assays using statistical/machine learning analysis
- DARPA Biostasis Project - re-engineering cryptobiotic proteins from extremophiles to function in humans
  - Trained a neural network on cryptobiotic proteins in order to infer unique properties of these proteins and generate novel ones that maintain functionality
- Senior Thesis - developing new methods to generate and optimize protein sequences
  - Using invertible neural networks and variational inference to approximate the intractable distribution of any protein function predictor. Applying Bayesian experimental design to explore the most promising sequences
  - Presenting poster on research at NeurIPS, Learning Meaningful Representations of Life Workshop, Dec 2019

Dr. Michael Lynch Lab - Research Assistant, Duke University, BME Department, June 2018 - May 2019

- Making genetic engineering more safe, precise, and efficient by developing machine learning models to predict CRISPR cutting and homology directed repair rates for more optimal guide RNA design

Sunflower County Freedom Project - Teaching Intern, Sunflower County Mississippi, May 2017 - July 2017

- Taught math to 9th and 7th grade students in a summer remedial education program
  - Designed and ran extra-curricular program titled: “From Kendrick to Le-Bron - The Secrets of Success”

Interests and Activities

Duke University:

- Developed “Tail-Free Sampling” - a new method to generate sequences from autoregressive neural networks, July 2019 - Present
  - Work currently published as a blog post (https://trentbrick.github.io/Tail-Free-Sampling/)
- Investigating the ability for deep reinforcement learning agents to discover and prove Byzantine Fault Tolerant consensus protocols. Supervised by Dr. Kartik Nayak, September 2019 - Present
- Winning team at the American Statistical Association’s (ASA) “Datafest @ Duke”, April 2018 & 2019
  - ~400 competitors each year. In 2019 won “Best Insight” using Canadian National Women’s Rugby Sevens data. In 2018 won “Judges Pick” using Indeed.com data
- Co-founder and Discussion Leader for the "Arete Fellowship" (http://eaduke.org/faq/), September 2018 - May 2018
  - A 10-week crash course in Effective Altruism for undergraduates. Had 70 applicants, accepted and taught 18 of them. End of course anonymous survey had the course rated as a 4.53 out of 5
- Presented poster at Triangle Machine Learning Day and talk at Duke Machine Learning Day, March 2018
  - Research used machine learning to predict Facebook users’ Big Five personality type given their activity data
- Regional Finalist in Boston for the Hult Prize, global social entrepreneurship competition with a $1M prize, 2016

Eton College:

- Co-House Captain of Boarding House: Appointed by Housemaster as Co-Head of House of 55 boys, 2015 - 2016
- Founder and Chairman of The Eton and Holyport College Investment Club, 2014 - 2016
  - 24-member Investment Club of Sixth Form students (high school juniors and seniors) who independently raised from donors and managed a real money philanthropic fund of over £20,000
- Benedictus Trust Young Scholars Essay Prize winner: "My vision for the Future of Education", June 2016
  - Presented and discussed essay at an Oxford University research forum event

Skills, Qualifications and Personal Interests

Computer programming including: Java, Python, Matlab, JavaScript & R; US, Canadian, and UK citizenship; Hobbies include squash, travel, and film photography