Jacob Mantooth

📞 405.756.7226 | ✉ Jacman@ecok.edu

RESEARCH EXPERIENCE

Generalizing the Boltzmann Equations August 2022 –

- What happens when two rarefied gases consisting of monotonic molecules collide
- Seek to derive the Boltzmann Equation by using the Maxwellian polynomial in replacement of the Hermite

- Built simple RL models based on everyday games such as Checkers,Black-Jack,Rock Paper & Scissor and Go Fish
- Looked at three ways to initialize the weights between the layers and compare the results

Comparing RL to OC Methods on the continuous Mountain Car Problem June 2022 – July 2022

- Compared three methods in solving the continuous mountain car problem
- The three methods include one local solution and two global solutions ie, RL & OC
- Used Hamilton-Jacobi-Bellman (HJB) equation to train an approximating neural network for the value function

Mathematics of Deep Learning, and SVD May 2021 – May 2022

- Examined the mathematics of deep learning by building a model in the deep learning style
- Explored the PCA dimensional reduction, linear regression, and how these work when interchanged
- Provided a proof on the interactions of the PCA and linear regression
- Used python, Jupyter notebooks, TensorFlow, NumPy, pandas and ORUs Titan super-computer, we are able to create models of deep learning to examine the mathematical tools utilized

Temperatures Affect on Ultra Sonic Waves January 2021 – May 2021

- Sought to find the connection between temperature and ultrasonic waves
- Using a multitude of different types of oils, we were able to show that as we increase the temperature of the oils, the velocity of sound decreases

Covid-19 and Travel July 2020 – December 2020

- We used google data to show the relationship between Covid-19 and travel. We were able to code multiple inactive models showing the spread and how it affected travel, all hosts online
- Sought to find a correlation between travel and covid-19 to make more accurate predictions

Operation Research January 2020 – May 2020

- Assigned to a local oil business named Cantrell Jackson
- Our primary goal was to look at their data and find ways to reduce money loss and optimize truck efficiency

EDUCATION

East Central University August 2019 – May 2023
B.sc., Mathematics, Physics Ada, OK

Lindsay High School August 2015 – May 2019
High School Diploma Lindsay, OK

POSTER PRESENTATIONS

Comparing RL to OC Methods on the Mountain Car Problem (1st Place Winner)
2022 Computational Mathematics REU at Emory University   July 2022

Temperatures Affect on Ultra Sonic Waves
McNair Intern Poster Display   April 2022

Mathematics of Deep Learning, and SVD
Oklahoma Research Day at the Capital (Chosen to be my school only representative)   March 2022
Oklahoma Research Day   March 2022
Oklahoma Academy of Science   November 2021

Covid-19 and Travel
Oklahoma Research Day   March 2021
Oklahoma Academy of Science   November 2020

Cantrell Jackson
Oklahoma Research Day   March 2020

ORAL PRESENTATIONS

Mathematics of Deep Learning, and SVD
Oklahoma Academy of Science   November 2021

Covid-19 & Travel
Oklahoma Academy of Science   November 2020

CONFERENCE ATTENDED

30th Annual UMBC McNair Scholars Research Conference   October 2022

OK-LSAMP 28th Annual Research Symposium   October 2022

SKILLS

Languages : Python, HTML,Git,R,linux,C#,Excel
Skills : Computer skills, Leadership experience, Communication skills, Collaboration talent, People skills, Problem-solving abilities

PROFESSIONAL EXPERIENCE

Tutor   2021-2022
                                                                                            Ada,OK

- One-on-one tutoring in Mathematics, Biology, Physics
- Adapted teaching style to the unique needs of students
- Prepared weekly lesson plans to help students prepare for their courses
- Recognize the primary role of helping students become more confident, more successful, self-directed learners

TH Rogers Lumber Co. Lindsay   2020-2021
Yard Foreman   Lindsay, OK

- Manages yard operations and works in yard to assist customers
- Managed dry wall delivers to customer

- Maintained yard and warehouse upkeep and repairs
- Ensure safe and effective use of forklift machines
- load products, and deliver and transport materials to customer sites

Super C   2019-2020
Manager   Lindsay, OK

- Ensure that grocery shelves are maintained clean and organized
- Provide excellent customer services for sales growth
- Unload/load delivery trucks
- Ensure safe and effective use of forklift machines
- Manage daily operations of grocery store to meet store goals

RECOGNITION'S & SCHOLARSHIP'S

- 1st Place Winner of the 2022 Research Poster Competition in the Undergraduate Math/Computer Science Category at Emory REU
- Powerlifting 90kg collegiate state champ
- NASA Fellowship
- Ronald E. McNair Research Fellowship
- LSMAP Scholar
- McNair Scholar
- President honor roll(x2)
- Dean honor roll (x2)
- Lance Fenton Math Scholarship
- Higginbotham Family Scholarship
- Charles & Lila Acker Math Scholarship
- Oklahoma Teacher's Promise Scholarship