Pawan Kumar Thapaliya

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SUMMARY

- Ph.D. student with skill of designing mathematical model, physics, biophysics, neuronal and non-neuronal cells, programming of dynamics and stochastic simulation, machine learning, deep learning, data analysis and data visualization to produce meaningful result. Individual with Humble, honest, hardworking, understanding, enthusiastic for learning new skills, cool temperament, quickly adaptive in the new and changing environment and eager to collaborate character.
- Hands-on experience on programming tools, e.g. python, Matlab, FORTRAN, C++, and Java

EDUCATION

Anticipated May 2024 Ph.D. in Applied Physics (GPA: 3.83) University of South Florida, Tampa, Florida

July 2019 M.S. in Physics(GPA: 3.62) University of Texas Rio Grand Valley, Brownsville, Texas

KEY SKILLS

- Voltage- and ligand-gated ion channels at central and peripheral synapses.
- Synaptic integration and plasticity
- Hodgkin-Huxley model
- Get data from a MongoDB database
- Explore and clean time series data, build auto regression models, tune hyper parameters
- Load multiple CSV files into Pandas DataFrame, clean messy data with wrangle function
- Examine the relationship between variables using correlation
- Create a machine learning pipeline with feature encoding and imputation

- Create insightful visualization like histograms, a Mapbox, Scatter plot, a heatmap, and a bar chart for model coefficients
- Ability to engineer Big Data computing frameworks, data modeling and other relevant software tools.
- Ability to build linear, logistic, Ridge and quantile regression model.
- Extract data from a SQL database
- Perform a randomized train-test split
- Build a logistic regression model for classification
- Build a decision tree model for classification
- tune model hyperparameters
- Hand on experience on XGBoost, PyTorch and TensorFlow
- Navigate a file system using the command line
- Load and save files using Python
- Work with imbalanced data using resampling
- Build ensemble models like random forest and gradient boosting trees
- Evaluate a classification model using precision and recall

Research Experience

August 2019-present Graduate Research Assistant University of South Florida, Tampa, Florida

Project: Modeling ion concentration dynamics and neuron-vascular coupling during a seizure and spreading depolarization.

- We employed the least-square fit method to fit NMDA and AMPA currents. Then, we used the Rk4 or Euler method to get the solutions of differential equation.
- Our Markov kinetics model predicts that bio-energy loss is higher in neo-cortical astrocytes than in hippocampal astrocytes.

August 2016-July 2019 Graduate Research Assistant University of Texas Rio Grand Valley, Brownsville, Texas.

Project: Bubble Nucleation and Cooperativity in Duplex Stretching of a Helicoidal DNA Model

- Using metropolis hasting algorithm, we discovered that long DNA strands tolerate more stretching force than short DNA oligomers. (In process of publication)

Teaching Experience

May 2020-July2020 Adjunct Instructor University of South Florida, Tampa, Fl

- Selected out of 65 TA to teach General Physics II(2054-802) lecture portion(online)

Aug 2019- present Teaching Associate University of South Florida, Tampa, Fl

- Teaching General PHYSICS Lectures and Labs-
  General Physics I (2053-802) Lecture
  PHY 2049.803 Lecture
  General Physics II(2054-802/801) Lecture
  General Physics I Laboratory (PHYS 2053)
  General Physics II Laboratory (PHYS 2054)
  General Physics II Laboratory (PHYS 2048)

Membership and Volunteering

Organization for Computational Neuroscience (OCNS) member 2020-present
Society for Neuroscience(SFN) member 2023-present

American Physical Society member 2016-2019

The American Association of Physicisits in Medicine member 2017-18

Organization for Computational Neuroscience2020-present

Conference Assistant
Organization for Computational Neuroscience May 2021-Jul 2021 – 3 month
Science and technology

- Part of the Web Organizing Committee(WOC) that organized the 30th Annual computational Neuroscience Meeting CNS2021 Online from July 3rd to 7th ,2021

Publication

Modeling the heterogeneity of sodium and calcium homeostasis between cortical and hippocampal astrocytes and its impact on bioenergetics Front. Cell. Neurosci., 30 January 2023 Sec. Non-Neuronal Cells Volume 17 – 2023 | https://doi.org/10.3389/fncel.2023.1035553

Inward Operation of Sodium-Bicarbonate Cotransporter 1 Promotes Astrocytic Na^+ Loading and Loss of ATP in Mouse Neocortex during Brief Chemical Ischemia *Cells* **2023**, *12*(23), 2675; https://doi.org/10.3390/cells12232675

Presentation:

Poster title “Modelling the Impact of Astrocytic NBCe1 on Ischemia-Induced Astrocytic Na^+ Loading and ATP Depletion in Mouse Neocortex” SFN NEUROSCIENCE 2023 (11-15-2023).

Poster title "Modeling the heterogeneity of sodium and calcium homeostasis between cortical and hippocampal astrocytes and its impact on bioenergetics."
USF Health Research Day 03-03-2023.

License and Certificates:

• SQL for Data Science, Coursera, Issued Sep 2020
• Introduction to Data Science in Python, Coursera, Issued Jul 2020
• Neural Networks and Deep Learning, Coursera, Issued Jul 2020

Awards:

• First runner-up during one health codeathon at the University of South Florida held by Precision medicine: Protein, disease, drug discovery, and more. Build neural network model for protein-protein interactions and network using Python packages and libraries.

License and Certificate

- SQL for Data Science CourseraIssued Sep 2020
- Introduction to Data Science in Python CourseraIssued Jul 2020
- Neural Networks and Deep Learning CourseraIssued Jul 2020

For more information, please visit my Linkedin profile given in the link above.

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