Ishan Saran

Postgraduate associate, Yale School of Medicine

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Experiences

Yale School of Medicine, Clinical and Translational Research Accelerator

New Haven, CT

Postgraduate Associate, Advisor: **Dr. F Perry Wilson** *June 2020 - current*

- Designed and tested the model architecture for various prognostic models with biostatisticians, physicians, and machine learning experts to optimize statistical metrics; e.g. AUC-ROC scores. *Key areas:* ***feature engineering, dimensionality reduction, model development***
- Created a computational tool to enhance the standardized coding of *acute kidney injury*; packages in **Python** and **R**; standalone app, website, and documentation at `akiflagger.readthedocs.io`. *Key areas:* ***full-stack development, R Shiny, nephrology***
- Assemble and reviewed articles to generate a systematic review of physician versus computer model prediction performance and abnormal etiologies of secondary hypertension, acute kidney injury electronic alerts. *Key areas:* ***paediatrics, secondary hypertension, exploratory data analysis***

Emory Departments of Physics and Biology

Atlanta, GA

Student Honors Research, Advisor: **Dr. Gordon Berman** *September 2018 - May 2020*

- Built computational models (RNNs, CNNs, etc.) to model and predict fly dynamics and build behavioral representations in Python. *Key areas:* ***neural networks, postural decomposition, theoretical biophysics***
- Compared different statistical techniques (t-SNE, UMAP, etc.) to reduce the dimensionality of big data in Python. *Key areas:* ***dimensionality reduction, hyperparameter optimization, model selection***
- *Honor's Thesis:* Completed and defended undergraduate thesis *Representing Fly Behavior with Recurrent Neural Networks* to obtain highest honors. *Key areas:* ***Drosophila research, computational ethology, machine learning***

Princeton Center for the Physics of Biological Function

Princeton, NJ

Summer Student *June 2019 & June 2020 - Aug 2020*

- Selected amongst a group of 30 to participate in a biophysics summer symposium on state-of-the-art physical modeling techniques. *Key areas:* ***bird-song and bacterial motion patterns, statistical mechanics, machine learning***
- Carried out lab research to determine motility patterns in bacterial populations; applied tracking algorithms in Python for bacterial and bird populations. *Key areas:* ***E. coli research, fluid dynamics, flock dynamics***
- Watched Nobel Prize laureates give lectures on research. *Key areas:* ***Drosophila embryology, animal tracking, behavioral representations***

Yale School of Medicine, Program of Applied Translational Research

New Haven, CT

Student Researcher, Advisor:**Dr. F Perry Wilson** *May 2019 - August 2019*

- Developed and tested different machine learning models to predict outcomes and develop risk scores for patients with acute kidney injury, end-stage renal disease in pediatric patients, recovery rates for heart failure patients Python. *Key areas:* ***cardiology, nephrology, paediatrics***
- Worked alongside biostatistician to create and verify data sets for future analysis. *Key areas:* ***data cleaning, feature engineering, model selection***

Emory Department of Physics

Atlanta, GA

Physics mentor, TA *September 2018 - May 2020*

- Taught introductory physics (*3 semesters*) covered topics on kinematics and motion, classical and fluid mechanics, thermodynamics, electricity and magnetism, and optical and wave phenomena. *Key areas:* ***classical mechanics, electrodynamics, thermodynamics***
- Taught advanced electricity and magnetism (*1 semester*) covered topics including using Fourier series to construct voltage functions, deriving optical phenomena from Maxwell's equations, Fresnel equations, radiation pressure, etc. *Key areas:* ***optics, statistical mechanics, electrodynamics***

Education

Emory University

Atlanta, GA

Bachelor of Science in Physics, summa cum laude *May 2020*

- Major GPA: **3.87/4.00**; Overall GPA: **3.74/4.00**

Ed. W Clark High School

Las Vegas, NV

Advanced Honors Diploma *May 2017*

- GPA: **3.78/4.00**

Skills

Languages Python, R, HTML, CSS & JavaScript; Hindi, Chinese (conversational)

Interests Data analysis, visualization, machine learning, statistics, mathematical modeling

Publications

[1] Aditya Biswas, **Ishan Saran**, and F Perry Wilson. Introduction to supervised machine learning. Kidney360, 2(5):878–880, 2021.

[2] James T Nugent, Chelsea Young, Melissa C Funaro, Kuan Jiang, **Ishan Saran**, Lama Ghazi, F Perry Wilson, and Jason H Greenberg. Prevalence of secondary hypertension in otherwise healthy youth with a new diagnosis of hypertension: A meta-analysis. The Journal of Pediatrics, 2022.

[3] Ibrahim Sandokji, Yu Yamamoto, Aditya Biswas, Tanima Arora, Ugochukwu Ugwuowo, Michael Simonov, **Ishan Saran**, Melissa Martin, Jeffrey M Testani, Sherry Mansour, et al. A time-updated, parsimonious model to predict aki in hospitalized children. Journal of the American Society of Nephrology, 31(6):1348–1357, 2020.

[4] Ugochukwu Ugwuowo, Yu Yamamoto, Tanima Arora, **Ishan Saran**, Caitlin Partridge, Aditya Biswas, Melissa Martin, Dennis G Moledina, Jason H Greenberg, Michael Simonov, et al. Real-time prediction of acute kidney injury in hospitalized adults: implementation and proof of concept. American Journal of Kidney Diseases, 76(6):806– 814, 2020.

Awards, Memberships, and Honors

2022	Yale Cyberforum Leadership Workshop
2021-2022	Captain of Yale Chess Club
2020-2021	2021 OpenCV Spatial AI Competition Finalist
2021	Kidney STARS Award Recepient, attendend and presented at ASN Kidney Week 2021
2020	Attended and presented at neuromatch3.0
2020	Defended honors thesis in physics, received highest honors award
2017-2020	President, Vice President, Captain of Emory Chess Club
2019	Kidney STARS Award Recepient, attendend and presented at ASN Kidney Week 2019
2017	We the People District Competition Award Winner
2017	CKSF National High School Biology Championsip, 8th place
2017	DECA Business Law & Ethics State Champion
2017	HOSA Biomedical Debate State Champion
2016-2017	International Public Forum Debate Champion | Top 10 at Debate Nationals
2016-2017	Speech and Debate State Champion Runner-up; 2nd in State Championship
2016-2017	Gold Medalist in Anatomy & Physiology in the Nevada Science Olympiad
2016-2017	Top 10 International Public Forum Debate Champion
2015-2017	President, Captain of Ed W Clark Chess Club
Summer 2016	Elected Lieutenant Governor at Nevada Boys' State
2016	Best Delegate Award at University of Nevada, Las Vegas, United Nations Environmental Programme
2015-2016	National Merit Scholar Semifinalist
2015-2016	US Denker Tournament of High School Champions
2015-2016	5-time Nevada State Chess Champion | Top Upset Prize
2015	*Commendable Delegate*, General Assembly, Model United Nations