

Keerat Kaur Guliani

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CAREER INTERESTS

Data Science — Causality & Reinforcement Learning — Application of computational methods to Health & Policy-Making — Deep Learning

Self-motivated and Quality-oriented, I am driven by the impact of my work.

EDUCATION

- Indian Institute of Technology, Roorkee** Uttarakhand, India
B.Tech - Civil(Major), Computer Science(Minor); CGPA: 9.55/10, Class Rank: 2/151 Jul 2018 - May 2022
Courses: Machine Learning, Probability & Statistics, Linear Algebra & Calculus, Computer Vision, Numerical Methods & Computing, Quantum Computing, Operating Systems, Systems Analysis, Data Mining for Business Intelligence, Algorithms & Analysis, Theory of Computation, Database Management Systems, Artificial Intelligence, Computational Geometry
- The Mother's International School** New Delhi, India
Science; Percentage in Class 12: 98%; CGPA in Class 10: 10/10 2014 - 2018

SKILLS SUMMARY

- Languages:** Python, C++, Git, Shell Scripting
- Frameworks:** Scikit, TensorFlow, Keras
- Tools:** MS Office(Excel, Word, PowerPoint), LaTeX, Jupyter Notebook, Streamlit, GIS, VAST, Mujoco
- OS:** Windows, Linux, macOS

PAPERS

- VacSIM: Learning Effective Strategies for COVID-19 Vaccine Distribution using Reinforcement Learning**[Paper][Dashboard]: *Published in Elsevier IBM. Presented at the *RAISE Summit 2020 & MIT's Vaccines For All Conference** VacSIM concatenates Sequential Decision-based RL models with a Contextual Bandits approach for optimizing the distribution of COVID-19 vaccine.
- Less Wrong COVID-19 Projections With Interactive Assumptions** [Preprint]: *Submitted to the *Bulletin of the World Health Organisation** Demonstrated the use of Agent Based Models to simulate the spread of COVID-19 virus.
- DEAP Cache: Deep Eviction Admission and Prefetching for Cache** [Preprint]: *Submitted to *AAAI 2021* as a Student Abstract* Proposed an end-to-end pipeline for learning all the three components of caching strategies using ML.
- Universal Adversarial Perturbations - A Survey** [Preprint]: *Submitted to *ACM CSUR** First comprehensive survey paper in the direction of Universal Adversarial Perturbations in DL.
- Long Span Arch Bridges in India: Design Aspects and Aesthetics** [Paper]: *Accepted(Oral) at the International Conference on Arch Bridges Portugal. Published in Springer, Proceedings of ARCH 2019*

INTERNSHIPS

- DAAD WISE Research Internship** Remote
Machine Learning Lab, University of Freiburg, Germany Jul 2021 - Sep 2021
 - AutoRL:** Worked on a Novel Population-Based method for AutoRL. Building upon two previous algorithms on Population-Based Training of Reinforcement Learning agents.
- Learning Analytics** Remote
Plio@Avanti Fellows Summer 2021
 - Data Science:** Analysed the Learning Behaviour of Students using Plio. Extensively used Python and Pandas for data analysis. Read about takeaways [here](#).
- Synaptic Connectivity Detection** Remote
Lichtman Lab, Harvard University Jun - Dec 2020
 - Deep Learning & Developmental Connectomics:** Performed Synaptic Location & Connectivity Detection to get Synaptic Segmentation in the mouse cerebellum. Prediction pipeline concatenated 3D U-Net & 3D CNN models.
- CoronaActionIndia** Remote
MEDAIM, IIIT Delhi Summer 2020
 - Reinforcement Learning & Public Health:** Developed an RL environment compatible with OpenAI gym as the basis for a novel pipeline *VacSIM* to ensure fair distribution of vaccines developed against Coronavirus. Read more [here](#).

PROJECTS

- Synthetic Data Generation** [Slides][Code] (Volunteer at Data Dive, DataKind): Worked in collaboration with Medic Mobile and Dimagi, to use ML & AI tools to generate, assess synthetic patient data and provide recommendations for its development via statistical hypothesis testing. (Mar'21)
- Impact of COVID-19 on Urban Travel Behaviour and Mode Choices** [Slides] (Curriculum Project, IIT Roorkee): Built a web-based questionnaire from scratch to statistically analyse the impact of COVID-19 on Urban Mobility and Travel Behaviour. End-to-end data collection/cleaning/analysis project using Excel and Python. (Spring'21)
- Classification of EEG Signals** [Code] (CBTB Lab, IIT Roorkee): Compared performance of ML & DL architectures to classify the EEG Signals into Focal or Non-focal epileptic type, that would increase efficiency & accuracy of epileptic diagnosis. Best accuracy of 88% achieved using Random Forest Classifier beat that by Neural Net model. (Summer'19)

HONORS AND AWARDS

- DAAD-WISE 2021 Scholar(Supervisor: Dr Frank Hutter)
- Awarded the Jagdish Prasad & Shail Goyal Excellence IITR Heritage Foundation Award & Scholarship for outstanding academic, co-curricular and extra-curricular achievements.(Mar'21).
- Awarded the ENCORE Scholarship for 2020-21 by IITR'89 Batch amongst top 10 students in Third Year B.Tech based on merit(Jan 2021).
- Awarded the Summer Research Fellowship for 2020 by the Indian Academy of Sciences.
- All-India Rank 7964, Joint Entrance Examination(Advanced) 2018 among 1,50,000 students.
- All-India Rank 7130, Joint Entrance Examination(Mains) 2018 among 12,00,000 students.
- All-India Rank 14558 and Category Rank(UR) 8891, National Eligibility cum Entrance Test (Medicine) 2018, among 13,26,000 students.
- National Talent Search Examination Scholar (2016).

OTHER EXPERIENCE

- Attendee, Women in Data Science(WiDS) Conference (Mar'21).
- Finalist, Goldman Sachs Women's Possibilities Summit: Finance (Feb'21).
- Attendee, NeurIPS Conference (Dec'20).
- Participant, Data Science for Social Good Workshop [Lightning Slide] (Nov'20).
- Team Leader, Global Adobe Analytics Challenge (Oct'20).
- Delegate, Winter Workshop on Machine Intelligence & Brain Research at IIT Madras, India (Jan'20).

EXTRA-CURRICULAR

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| • Co-President, Vision & Language Group
<i>Co-leading a student group that fosters Deep Learning research culture in the campus.</i> | IIT Roorkee, India
<i>Sep 2019 - May 2022</i> |
| • Treasurer, ACM Student Chapter
<i>Co-leading a student group that unites the computing fraternity in the campus.</i> | IIT Roorkee, India
<i>Sep 2019 - May 2022</i> |
| • Additional Secretary, The Debating Society
<i>Represented the college & won laurels in Parliamentary Debating.</i> | IIT Roorkee, India
<i>Aug 2018 - May 2022</i> |
| • Editor, Watch Out!
<i>Official student media body of the campus.</i> | IIT Roorkee, India
<i>Aug 2018 - May 2022</i> |
| • Student Mentor, Student Mentorship Program
<i>Mentored 22 freshmen in their transition to college life during the pandemic.</i> | IIT Roorkee, India
<i>Dec 2020 - Jul 2021</i> |