Rishab Khincha

rkhincha@utexas.edu | +1 737-895-6046 | rishabkhincha.github.io/

Education

The University of Texas at Austin
M.S. Computer Science | Aug 2021 – May 2023
Coursework: Advanced Topics in CV, NLP. TA: Advanced ML

BITS Pilani
B.E. Computer Science, M.Sc. Physics | Aug '16–Jun '21
GPA 9.35/10, Awarded the Institute Merit Scholarship

Skills

C/C++, Java, Python, MySQL, CSS, HTML5, Tensorflow, Pytorch, Keras, BPMN, REST API

Experience

MIT Media Lab | Research Affiliate (Remote)
Boston, MA | Jun 2020 – April 2021
Advised by Prof. Pattie Maes

Built robust, multi-modal ensemble methods using novel acoustic, pause, and intervention features for severity prediction of Alzheimer's Dementia. Our proposed ensemble methods [P1, P2] not only beat existing SOTA methods but also provided more reliable and trustworthy predictions, disentangling the uncertainty estimates from different modalities.

Goldman Sachs | Software Engineering Intern
Bangalore, India | May 2020 – Jun 2021

Wrote REST APIs in Java and created BPMN workflows to build a loan reconciliation application that escalates inconsistencies in the database to the operation team as an eTask. Worked with multiple technical and operations teams for the successful integration of the app.

RIKEN | International Program Associate (Remote)
Wako, JP | Feb 2021 – July 2021
Advised by Dr. Franco Nori, Dr. Clemens Gneiting

Studied the noise robustness of analog optimization methods for NP-Hard problems and built mathematical models to understand how the behavior scales with the problem sizes (up to 10^3 spins).

APP Center for AI Research | Student Researcher
Goa, India | Jan 2020 – Jun 2021
Advised by Prof. Ashwin Srinivasan, Dr. Lovekesh Vig

Built ResNet, DenseNet, and UNet models using Tensorflow for medical imaging tasks, improving the existing SOTA in tumor classification [P5] and lung disease identification [P4]. Worked with a team of doctors and scientists to understand how AI models and explanations can be trusted by clinicians [P3].

Selected Projects [Github]

Risk Stratification of Alzheimer's Dementia (AD)
MIT Media Lab | Prof. Pattie Maes

Built an open-source platform for modeling risk stratification of AD using spontaneous speech features. Proposed Deep Split Ensembles [P2] and UA Ensembles [P1] where we beat existing SOTA while disentangling the predictive uncertainties and reducing the system's entropy.

Constructing and Evaluating an Explainable Model for COVID-19 Diagnosis
TCS Research & BITS Goa | Prof. Ashwin Srinivasan

Worked with a radiologist to build a new COVIDr dataset with critical radiological annotations and to understand the clinical efficacy of visual and textual explanations through a web interface. Constructed a neuro-symbolic model to extract domain-specific features from chest X-rays using DNNs, and a decision tree for diagnosing COVID-19 using these features. [P3]

Deep Diagnosis of COVID-19 from Chest X-rays
TCS Research | Prof. Ashwin Srinivasan, Dr. Lovekesh Vig

Built a UNet model to isolate the lungs region from the rest of the chest and built a model to detect COVID-19 from the segmented lung. Employed embeddings of disease symptoms produced by the CheXNet network and created an ensemble to assist the model in classification [P4]. Prime Minister's office is interested in using this tool for mass screening in airports and railway stations.

Robustness to Missing Features using Split NNs
MIT Media Lab | Prof. Pattie Maes

Used hierarchical clustering to cluster similar features and then trained split neural networks with a joint loss. We showed promising improvements on benchmark regression datasets even with simple imputation techniques like mean imputation [P6].

Social Networks-based Telegram Chatbot
BITS Goa | Prof. Neena Goveas

Built a platform-agnostic Python interface that scrapes chat data, classifies users(experts/users), and suggests experts and timings for various topics extracted from the chat. [P7]

Selected Publications [Google Scholar]

[P1] Uncertainty-Aware Boosted Ensembling in Multi-Modal Settings
U Sarawgi*, R Khincha*, W Zulfikar*, S Ghosh, P Maes
ML4H Workshop NeurIPS 2020, IJCNN 2021 [*Paper* | *Talk*]

[P2] Why have a Unified Predictive Uncertainty? Disentangling it using Deep Split Ensembles
U Sarawgi, W Zulfikar, R Khincha, P Maes [*Preprint*]

[P3] Constructing and Evaluating an Explainable Model for COVID-19 Diagnosis from Chest X-rays
R Khincha, S Krishnan, K Guru-Murthy, T Dash, L Vig, A Srinivasan [*Preprint*]

[P4] CovidDiagnosis: Deep Diagnosis of COVID-19 Patients using Chest X-rays
K Mahajan, M Sharma, L Vig, R Khincha, S Krishnan, et al.
MIL3D, MICCAI 2020. Springer LNCS [Paper]

[P5] A Case Study of Transfer of Lesion-Knowledge
S Krishnan, R Khincha, L Vig, T Dash, A Srinivasan
TIA, MICCAI 2020. Springer LNCS [Paper | Talk]

[P6] Robustness to Missing Features using Hierarchical Clustering with Split Neural Networks
R Khincha, U Sarawgi, W Zulfikar, P Maes
AAAI 2021 (Student Abstract) [Paper | Poster]

[P7] Network Community Analysis Based Enhancement of Online Discussion Forums
S Krishnan, R Khincha, N Goveas
CODS-COMAD 2021 YRF - Honorable Mention [Paper | Talk]

Achievements

- Selected, **Google Research AI Summer School**, Aug 2020
- Winner, **Ingenuity Challenge**, Oct 2020
- Runner-up, **Goldman Sachs Intern Coding Challenge**, Jun 2020
- Bronze, **Shell Windmill Optimisation Challenge**, Sep 2020