

Rishab Khincha

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Education

May 2021	Birla Institute of Technology and Science (BITS) Pilani	Goa, India
Aug 2016	Bachelor of Engineering, Computer Science Master of Science, Physics	CGPA: 9.30/10

Experience

Present	RIKEN Cluster for Pioneering Research [🌐]	Wako, Japan
Feb 2021	International Program Associate Advisors: Dr. Franco Nori, Dr. Clemens Gneiting Studying the noise robustness of analog optimization methods for NP-Hard problems.	
Present	Massachusetts Institute of Technology Fluid Interfaces, MIT Media Lab [🌐]	Cambridge, USA
Jun 2020	Research Affiliate (Senior Thesis) Advisor: Prof. Pattie Maes Working on building robust algorithms for severity prediction of Alzheimer's Dementia. Project dementAI	
Jun 2020	Goldman Sachs	Bangalore, India
May 2020	Software Engineer Intern Manager: Raghavendra Rao - Vice President Worked in the Loans Servicing team to build a loan reconciliation app using Java, BPMN and eTasks.	
Present	APP Center for AI Research [🌐] & TCS Research [🌐]	Goa, India
Jan 2020	Student Researcher Advisors: Prof. Ashwin Srinivasan, Dr. Lovekesh Vig and Prof. Tirtharaj Dash Building robust and interpretable models for medical imaging tasks.	
Aug 2019	Western University Nearby-Galaxies Group [🌐]	London, Canada
May 2019	MITACS Globalink Research Intern Advisor: Prof. Pauline Barmby Built an open-source image processing tool ImageCube to processes multi-wavelength astronomy datasets.	

Publications & Talks

Uncertainty-Aware Boosted Ensembling in Multi-Modal Settings

Rishab Khincha, Utkarsh Sarawgi, Wazeer Zulfikar, Pattie Maes

[Under Review]

[IJCNN '21]

Constructing and Evaluating an Explainable Model for COVID-19 Diagnosis from Chest X-rays [🌐]

Rishab Khincha, Soundarya Krishnan, Krishnan Guru-Murthy, Tirtharaj Dash, Lovekesh Vig, Ashwin Srinivasan

[Under Review]

Why have a Unified Predictive Uncertainty? Disentangling it using Deep Split Ensembles [🌐]

Utkarsh Sarawgi, Wazeer Zulfikar, Rishab Khincha, Pattie Maes

[Under Review]

[IJCNN '21]

Robustness to Missing Features using Hierarchical Clustering with Split Neural Networks [🌐] [Poster]

Rishab Khincha, Utkarsh Sarawgi, Wazeer Zulfikar, Pattie Maes

AAAI Conference on Artificial Intelligence, Honolulu, Hawaii, USA [Student Abstract]

[AAAI '21]

Uncertainty-Aware Multi-Modal Ensembling for Severity Prediction of Alzheimer's Dementia [🌐] [Poster]

Utkarsh Sarawgi, Wazeer Zulfikar, Rishab Khincha, Pattie Maes

Machine Learning for Health Workshop, NeurIPS, Vancouver, Canada

[NeurIPS '20]

Online Learning Assistant with Network Community Analysis [Honorable Mention] [🌐] [📺]

Soundarya Krishnan, Rishab Khincha, Neena Goveas

Young Researcher's Symposium, CODS-COMAD, Bangalore, India

[CODS-COMAD '21]

A Case Study of Transfer of Lesion-Knowledge [🌐] [Slides] [📺]

Soundarya Krishnan, Rishab Khincha, Lovekesh Vig, Tirtharaj Dash, Ashwin Srinivasan

Second Workshop on Medical Image Learning with Less Labels and Imperfect Data, MICCAI, Lima, Peru

[MICCAI '20]

CovidDiagnosis: Deep Diagnosis of COVID-19 Patients using Chest X-rays [🌐]

Kushagra Mahajan, Monika Sharma, Lovekesh Vig, Rishab Khincha, Soundarya Krishnan, Adithya Niranjan, Tirtharaj Dash, Ashwin Srinivasan, Gautam Shroff

Second Workshop on Thoracic Image Analysis, MICCAI, Lima, Peru

[MICCAI '20]

ECG Signal Analysis on an Embedded Device for Sleep Apnea Detection [🔗]

Rishab Khincha, Soundarya Krishnan, Rizwan Parveen, Neena Goveas
9th International Conference on Image and Signal Processing, Morocco

[ICISP '20]

How to do science with ImageCube [Invited Talk] [🔗]

Rishab Khincha, Pauline Barmby
Python in Astronomy 2020, Trinity College Dublin. Canceled due to COVID-19

[PyAstro '20]

Select Research Projects

Risk Stratification of Alzheimer's Dementia - **dementAI** [🔗]

June'20 - Present

Advisor: [Prof. Pattie Maes](#)

- Building an open-source platform for modeling risk stratification of Alzheimer's Dementia using spontaneous speech.
- Proposed 'Deep Split Ensembles' to disentangle the predictive uncertainties in the data. [🔗] [🔗] [Under Review]
- Novel ensembling technique using predictive uncertainties, showing good performance on the benchmark Dementia Bank dataset and potential for other multi-modal ensembling. [🔗] [🔗] [ML4H@NeurIPS '20]

Deep Diagnosis of COVID-19 from Chest X-rays

March'20 - Present

Advisors: [Prof. Ashwin Srinivasan](#), [Dr. Lovekesh Vig](#), [Prof. Tirtharaj Dash](#)

- Built a pipeline comprising of models for lung isolation followed by classification into different disease classes, achieving state-of-the-art results on the COVIDx dataset. [🔗] [MIL3D@MICCAI '20]
- Worked with a radiologist to build a new COVIDr dataset with important radiological annotations to be publicly released.
- Constructed a neuro-symbolic model and worked with radiologists to evaluate the clinical efficacy of visual and textual explanations from the models. [🔗] [Under Review]

Robustness to Missing Features using Split NNs

August'20 - Present

Advisor: [Prof. Pattie Maes](#)

- Proposed an effective approach to cluster similar input features using hierarchical clustering and then train proportionately split neural networks with a joint loss. [🔗] [🔗] [AAAI '21]
- Evaluated this approach on a series of benchmark datasets and show promising improvements even with simple imputation techniques.

Portable Holter Monitor with Real-Time Threat Detection

August'19 - December'19

Advisor: [Prof. Neena Goveas](#)

- Developed a pipeline combining data extraction, segmentation, signal cleaning and filtering to detect sleep apnea.
- Tested the pipeline on the MIT-Physionet dataset and found it to be well suited for deployment on resource-constrained embedded devices. [🔗] [ICISP '20]

Honours and Awards

Google AI Summer School, 2020 | Selected [🔗] One of the 50 students selected for the AI for Social Good track

RIKEN Cluster for Pioneering Research IPA, 2020 | Awarded [🔗] ¥1.3M funds for a visit to [Dr. Franco Nori](#)'s lab in Japan.

Goldman Sachs Intern Coding Challenge, 2020 | Runner-up Annual coding contest held amongst interns.

MITACS Globalink Research Internship, 2019 | Awarded [🔗] \$8000 grant to do research at Western University, Canada.

Ingenuity Challenge, 2020 | Winner [🔗] Optimisation challenge (travelling-thief) organized by the University of Adelaide.

Shell AI Hackathon, 2020 | Bronze Category [🔗] Windmill optimisation challenge organized by Shell

Teaching Assistant

Object Oriented Programming, Fall'19 [Prof. Neena Goveas](#) Prepared, invigilated and evaluated weekly lab sessions.

Competitive Programming, Summer'19 [QSTP](#), [Quark'19](#) Co-instructor – prepared course material and exams.

Computer Programming, Spring'18 & Spring'20 [Prof. Bharat Deshpande](#) Evaluated weekly lab sessions.

Electromagnetic Theory, Fall'18 [Prof. Kinjal Banerjee](#) Doubt solving in tutorial sessions, graded quiz papers.

Service

AI for Public Health Workshop | ICLR 2021 [🔗] Mentor

New in ML Workshop | NeurIPS 2020 [🔗] Reviewer

Machine Learning for Health Workshop | NeurIPS 2020 [🔗] Mentor

Department of CSIS | BITS Goa [🔗] Mentor