Rishab **Khincha**

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Education

May 2021 **Aug 2016**	**Birla Institute of Technology and Science (BITS) Pilani** Bachelor of Engineering, Computer Science Master of Science, Physics	**Goa, India** CGPA: 9.24/10, Core: 9.81/10 CGPA: 9.24/10, Core: 9.61/10

Experience

Present **June 2020**	**Massachusetts Institute of Technology	Fluid Interfaces, MIT Media Lab** [ ] *Research Affiliate (Senior Thesis)	Advisor: Prof. Pattie Maes* Working on building robust algorithms for severity prediction of Alzheimer's Dementia. Project dementAI	**Cambridge, USA**
June 2020 **May 2020**	**Goldman Sachs** *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.	**Bangalore, India**
Present **January 2020**	**APP Center for AI Research** [ ] **& TCS Research** [ ] *Student Researcher	Advisors: Prof. Ashwin Srinivasan, Dr. Lovekesh Vig and Prof. Tirtharaj Dash* Building robust and interpretable models for medical imaging tasks.	**Goa, India**
August 2019 **May 2019**	**Western University	Nearby-Galaxies Group** [ ] *MITACS Globalink Research Intern	Advisor: Prof. Pauline Barmby* Built an open-source image processing tool ImageCube to processes multi-wavelength astronomy datasets.	**London, Canada**
July 2018 **May 2018**	**Myra Medicine	Data Science Team** *Summer Intern	Manager: Manik Singhal* Analysed order data and profiled customers based on various purchasing patterns.	**Bangalore, India**
July 2017 **May 2017**	**Volvo CE** *Summer Intern	Manager: Sundara Murthy* Developed an Android application for inventory handling used internally in the warehouses.	**Bangalore, India**

Publications & Talks

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]

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

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]`

Online Learning Assistant with Network Community Analysis
Soundarya Krishnan, Rishab Khincha, Neena Goveas
Young Researcher's Symposium, CODS-COMAD, Bangalore, India   `[CODS-COMAD'21]`

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   Add - Add
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

New in ML Workshop | NeurIPS 2020 [❂] Reviewer

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

Department of CSIS | BITS Goa [❂] Mentor