

Nikhil Varma Keetha

+ (91) 9963253244 • keethanikhil@gmail.com • nik-v9.github.io • Nik-V9
in Nikhil-V

Education

Indian Institute of Technology (ISM) Dhanbad

Bachelor of Technology in Engineering Physics, Cum. GPA: 8.89/10.0

Dhanbad, India

Expected May 2022

Relevant Coursework

- Computer Programming * Data Structures * Engineering Thermodynamics * Methods of Applied Mathematics * Signals & Networks * Applied Electrical Engineering * Applied Optics * Mathematical Physics * Numerical and Statistical Methods * Classical Mechanics * Quantum Mechanics * Sensors & Transducers * Digital Signal Processing

MOOCs & Online Courses

- Machine Learning (Coursera) * Deep Learning Specialization (Coursera) * Secure & Private AI (FAIR, Udacity) * Self-Driving Cars Specialization (University of Toronto, Coursera) * Stanford CS231n * MIT 6.S094 * Deep Unsupervised Learning 2020 UC Berkeley

Technical Skills

Programming Languages: * Python * C/C++ * Matlab * JavaScript * Octave * \LaTeX

Libraries: * Pytorch * Tensorflow * Numpy * Pandas * OpenCV * Matplotlib * Scipy * PCL * GradSLAM

Environments/Tools: * Linux * Git/Github * AWS/GCP * UE 4 * CARLA * ROS * Jupyter * MS Office * Docker

Publications

Journal Papers

- N. V. Keetha, M. Milford, and S. Garg, "A hierarchical dual model of environment- and place-specific utility for visual place recognition," *IEEE Robotics and Automation Letters*, vol. 6, no. 4, pp. 6969–6976, 2021. doi: 10.1109/LRA.2021.3096751.

Preprint Articles

- N. V. Keetha, C. Wang, Y. Qiu, and S. Scherer, "AirObject: An Evolving Topological Graph-based Object Encoding for Semantic Loop Closure," *Carnegie Mellon University RISS Working Papers Journal*, vol. 9, 2021.
- N. V. Keetha, S. A. B. P., and C. S. R. Annavarapu, *U-det: A modified u-net architecture with bidirectional feature network for lung nodule segmentation*, 2020. arXiv: 2003.09293 [eess.IV].

Experience

AirLab Group, Carnegie Mellon University

Robotics Institute Summer Scholar (RISS) under Dr. Sebastian Scherer

Pittsburgh, USA

April 2021–Present

- Mentored by Dr. Chen Wang and Prof Sebastian Scherer
- Exploring Lifelong Graph Learning based 3D Object Encoding for Multi-Agent Semantic SLAM
- Leading the RISS Working Papers Journal team on logistics related to Peer Review and Journal Design
- Presented [2] at the University of Minnesota REU 2021 Poster Symposium.
- Presented RISS Summer Experience as a part of the 2021 RISS Community Seminar Series.

Poster | Video
Video

Robotics and Embodied AI Lab (REAL), Mila

Winter 2021 Research Intern

Montreal, Canada

Jan 2021–July 2021

- Mentored by Krishna Murthy Jatavallabhula and Prof Liam Paull
- Competed with 50 undergraduate and graduate students worldwide for a Winter 2021 Research Internship at REAL, Mila
- Explored multi-view consistent representation learning for 2D tasks such as depth estimation and semantic segmentation leveraging GradSLAM
- Member of the GradSLAM community involved in projects on material property recovery, NeRF based representations for SLAM
- Peer reviewed for *IEEE Robotics and Automation Letters (RA-L)*.
March 2021

QUT Centre for Robotics

Undergraduate Research Intern

Brisbane, Australia

Aug 2020–Feb 2021

- Mentored by Dr. Sourav Garg and Prof Michael Milford
- Explored Semantics in Robotic Localization and Mapping especially, Visual Place Recognition (VPR)
- Developed a Hierarchical Dual Model of 'Environment- and Place-Specific Utility' for Visual Place Recognition in challenging conditions such as drastic viewpoint shift and environmental changes.
- Paper [1] as first author accepted to *IEEE Robotics and Automation Letters (RA-L)*.
June 2021
- Presented Paper at *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2021*.
Video

IIT (ISM) Dhanbad

Undergraduate Research Intern

Dhanbad, India

Nov 2019—Aug 2020

- Advised by **Prof ACS Rao** (Department of Computer Science IIT(ISM) Dhanbad).
- Conducted meticulous research to identify information and answer multifaceted questions in the field of Application of Deep Learning to Bio-Medical Imaging and Agricultural Robotics.
- Developed a modified U-Net architecture with a BiFPN feature network (U-Det) based on semi-supervised learning for segmentation of lung nodules.

Paper | Code

PURE EV™

R&D Data Analyst

Hyderabad, India

May 2020—Aug 2020

- Worked on establishing frameworks for Range Prediction algorithms in the R&D team at PURE EV, an IITH EV startup, under the guidance of **Prof Nishanth Dongari, IITH**.
- Applied Statistical and ML Techniques to interpret key points from IoT sensor data and Battery data to drive production decisions.
- Studied Dynamic Models of Electric Vehicles for battery range analysis.

Amondial Capital

Machine Learning Intern

Singapore

Feb 2020—Apr 2020

- Developed Stock Prediction Models using Attention based LSTM Time Regression (TF 2.0) to predict the stock of various companies in the future for Financial Services in Amondial capital.

Projects

GradSLAM-RGB-D-Completion

December 2020

Framework: Pytorch

Github: [Link](#)

- Leveraged Multi-view gradients from GradSLAM to optimize RGB-D Images
- Performed extensive initialization experiments and gained insights on the potential of the gradslam framework for differentiable rendering and representation learning

COVID-19 Twitter Sentiment Analysis India (IBM Hackathon 2020)

June 2020—July 2020

Framework: TF 2.0

Github: [Link](#)

- Developed a Visualization Dashboard for COVID-19 Twitter Sentiment Analysis & Extraction using a modified Roberta & Roberta-CNN model. (**Demo | Presentation**)

Twitter Sentiment Extraction (Kaggle Competition)

May 2020—June 2020

Framework: Pytorch & TF 2.0

- Developed a modified Roberta base model with CNN head for Twitter Sentiment Extraction & Implemented Teacher Student learning and Ensembling for improvement of Model Performance
- Placed 58/2,227 (Top 3%) - Silver Medal

Reddit Flair Predictor

April 2020

Framework: TF 2.0 (Keras)

Github: [Link](#)

- Developed an XLNet language model based on Transfer Learning & a Web Application based on Flask API for Reddit Flair Classification

Workshops and Sessions Co-organized

- Organizer, **Tartan SLAM Series**: CMU Robotics Institute 2021
- Organized logistics for the **2021 RISS Community Seminar Series** 2021

Talks

- QUT Centre for Robotics, Visual Localization Group - HEAPUtil: Hierarchical Environment- and Place-Specific Utility for Visual Place Recognition *July 2021*
- Robotics and Embodied AI Lab, Mila - Bridging Human and Machine Semantics: HEAPUtil *Feb 2021*

Service and Mentoring

- Mentored 4 students at the undergraduate level & 1 student at the high school level on research.
- Associate Member of Cyberlabs ML & RoboISM (AI Clubs of IIT Dhanbad) mentoring students in Robotics & Deep Learning
- Indian National Service Scheme (NSS) Cadet actively taking part in community service activities.