

Ananth Kalyanasundaram

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RESEARCH INTERESTS

My research interests broadly lie in the field of Computer Vision and Deep Learning. My main research interests lie in 3D Scene Reconstruction from a single RGB image. I am also interested in 3D Panoptic segmentation and exploring the relationship between the 2D image space and the 3D voxel space.

EDUCATION

Technical University of Munich

MSc. Informatics

October 2021 - October 2023 (expected)

Munich, Germany

SRM Institute of Science and Technology

B.Tech (Computer Science and Engineering)

July 2016 - June 2020

Chennai, India

Percentage: 87.35/100

PUBLICATIONS

- **MRI Super-resolution using Laplacian Convolutional Neural Networks with Isotropic Undecimated Wavelet Loss.** S.Ramanarayanan, B.Murugesan, **A.Kalyanasundaram**, S.Prabhakaran, S.Patil, M.Sivaprakasam. 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society 2020 (EMBC 2020).
- **Detection of Pathological Myopia using Convolutional Neural Networks.** **A.Kalyanasundaram**, S.Prabhakaran, Briskilal.J, Senthil Kumar.D. International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 05, 2020

WORK EXPERIENCE

Human Analysis Lab, Michigan State University

Research Intern

September 2020 - Present

East Lansing, Michigan, USA

- Currently working on improving the performance of deep neural networks for the purpose of multi task learning under the supervision of Professor Vishnu Boddeti.

KPMG India

Data Analyst Intern

July 2020 - October 2020

Mumbai, India

- Worked on optimizing tax processes after analysis of data for the Tax Technology and Transformation team.
- Created automation software for OTP verification in websites.
- Tested several bots and ensured high quality output was produced.

SRM Medical College

Research Intern

August 2019 - June 2020

Chennai, India

- Analyzed and cleaned real-life Knee MRI data. Used image processing techniques to make the data trainable.
- Developed a novel loss function for this task which delivered better results and published a paper on the same at the IEEE EMBC 2020 conference.

- Implemented several state-of-the-art deep learning architectures for the task of Image Segmentation and Classification.
- Achieved a position in the top 20 of the leaderboard at the time of conclusion of challenges held by ISBI and SPIE Medical Imaging conferences.
- Conducted research using different architectures for the task of Super-resolution on Brain MRI.

PROJECTS

3D Semantic Reconstruction from a Single RGB Image

May 2022 - Ongoing

We propose a novel method that could reduce the training and inference time by a factor of 10 compared to prior methods. This project is done as a part of the ADL4CV course offered by TUM.

Cancer Cellularity Prediction System

December 2018 - March 2019

The challenge was to predict cancer cellularity given an image of a tissue. Achieved a position of 6 out of 100 teams at the time of conclusion, with a prediction probability of 0.88 using an ensemble of ResNet architectures. Developed a user interface for the same using Kivy.

Salt Segmentation for detection of Petroleum under Rocks

July 2018 - December 2018

Worked on the project as part of a challenge on Kaggle. The task was to segment salt regions in images of rock surfaces. Achieved a dice score of 0.83 on the dataset using a UNet with ResNet34 encoder and data augmentation techniques.

Histopathic Segmentation of Nuclei using Deep Learning

May 2018 - June 2018

This challenge was held as part of the MICCAI 2018 conference. Trained with the UNet architecture after applying extensive data augmentation techniques. Achieved a dice score of 0.82 on the test set.

COURSES

University Courses

- IN2064 Machine Learning
- IN2346 Introduction to Deep Learning
- IN2390 Advanced Deep Learning for Computer Vision : Visual Computing
- IN2298 Advanced Deep Learning for Physics
- IN2375 Computer Vision III: Detection, Segmentation and Tracking
- IN2354 3D Scanning and Motion Capture

Online Courses

- Machine Learning by Stanford University, Coursera
- Deep Learning Specialization by Andrew Ng
- Python for Everybody, Coursera
- Deep Neural Networks with PyTorch by IBM, Coursera
- AI Capstone Project with Deep Learning by IBM, Coursera

TECHNICAL SKILLS

Skills: Machine Learning, Computer Vision
Languages: Python, C++, MATLAB
Frameworks: Tensorflow, Pytorch, Keras, OpenCV