ANUKRITI SINGH
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EDUCATION

Banasthali University, Jaipur, India ***Bachelors of Technology,*** **July 2016-Jun 2020**
Relevant Coursework: Analog Integrated Circuit | Control System | Robotics | Digital signal processing | Electric drives and Controls | Data Structures | Digital Electronics | Pattern Recognition and Image Processing | Object Oriented Programming | Computer Organization and Architecture

RESEARCH EXPERIENCE

Defence Research and Development Organization (DRDO), India **Dec 2020-Present**
Project Assistant under Dr Narayan Panigrahi (scientist-G) at Centre of Artificial Intelligence and Robotics (CAIR). Working on satellite image processing and analysis.

University of Oregon, USA **Feb 2020-Oct 2020**
Visiting Student Researcher under Prof. Humphrey Shi, SHI Lab. Worked on visual grounding techniques, and image and video captioning.

Indian Institute of Science Education and Research (IISER), India **May 2019-July 2019**
Summer Research Intern under Prof. T S Mahesh, NMR Lab. Worked on integrating artificial intelligence with quantum computing. Simulated different quantum problems on machine learning modals.

National Institute of Technology (MNIT), India **May 2018-May 2020**
Summer Research Intern and Remote Lab Member of RAMAN Lab under Prof. Rajesh Kumar. Worked on image processing pipelines and optimization algorithms.

PROJECTS

Contrastive Behavioral Cloning (Python) **Jan 2021-Present**
A collaborative project on using contrastive learning based approaches to learn action mapping for image based applications like unmanned aerial vehicles.

Spatial Correlation in COVID-19 Cases (C++) **Dec 2020-Present**
Collecting and pre-processing world-wide corona virus cases, using spatial R, C and G statistics to find the correlation between different geo graphical factors and corona virus spread.

Visual Grounding and Captioning (Python) **Feb 2020-Oct 2020**
Implemented and performed experiments on visual grounding, finding a common ground between image captioning and visual grounding. Dense image captioning using fasterRCNN with ResNet as backbone.

Discord in a qubit (MATLAB) **May 2019-July 2019**
Implemented Restricted Boltzman Machine (RBM) architecture to find out the presence of discord in a ½ spin Quantum System. RBM is based on regeneration of outputs, in our case, the architect was trained to calculate discord for unknown quantum state.

Automatic Machine Vision Inspection System (Python) **Jan 2019-March 2019**
Target was to solve manual inspection of trains when they arrive on a station. Took a CNN like UNet to make an inspection bot for finding the fault in spring of a freight train in Railways.

Dark channel processing for medical image enhancement (MATLAB) **July 2018-Dec 2019**
A new approach was studied and tested - called the dark channel algorithm for different medical images. The technique was tested on various dataset from digital retina image to rat's renal microscopic image.

GRMSprop (MATLAB) **May 2018-July 2018**

RMSprop is a famous learning algorithm to optimize gradient descent in deep learning. We modified RMSprop for better result with less epochs by reducing the loss ratio for each moving average weights of neurons in neural network. We named it GRMSprop which stands for GainRMSprop.

Dehazing Aerial Images (MATLAB) **May 2018-June 2018**

Dark channel prior and gamma correction technique was used to dehaze the aerial images captured by remote sensing devices, the technique was tested and compared with different datasets.

PUBLICATIONS

- Batra, P., **Singh, A.,** & Mahesh, T. (2020). Characterizing Quantum Evolutions via a Recommender System. *arXiv: Quantum Physics* (link)
- **A. Singh**, A. Chandra, R. Kumar, K. Singh and N. Dey, " Dark Channel Processing for Medical Image Enhancement," 2019 *5th International WIE Conference on Electrical and Computer Engineering (WIECON-ECE),* Bangalore, 2019 yet to appear on IEEE Xplore (link)
- A. Chandra, **A. Singh**, R. Kumar and N. Dey, "Dehazing of Aerial Images by Dark Channel and Gamma Correction," *2018 3rd International Conference and Workshops on Recent Advances and Innovations in Engineering (ICRAIE)*, Jaipur, India, 2018 (link)

TECHNICAL SKILLS

- **Programming Languages**: C++, Python, MATLAB, Kuka programming language
- **Other Tools**: PyTorch, Tensorflow, Programmable Logic Controller
- **Development Platforms**: RaspberryPi, Arduino, Embedded Robotics

ACHIEVEMENTS

- Top 3% student researcher at Banasthali University
- Highest score for 8th semester project thesis
- Selected for IISER Pune summer project program which had acceptance rate of 8%
- Highest score in Department for Seminar presentation in 6th semester
- Certified for Smart India Rajasthan Hackathon’18
- Qualified as a delegate in IEEE Congress meets (AISYWC'17)
- Secured 3rd position at IETE Quiz'17 at Banasthali University

EXTRA-CURRICULAR ACTIVITIES

- Author at https://feminisminindia.com/
- Workshop TA under Prof. Nisheeth Joshi on Basics of Machine Learning and Python at Banasthali University
- Mentored 8 projects in a robotics competition at Banasthali University
- IEEE (Institute of Electrical and Electronics Engineers) Member
- IETE (The Institution of Electronics and Telecommunication Engineers) Member
- Core team member, Electronics Club (Samarthya), Banasthali University