LAKSHYA

Senior Undergraduate Student

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EDUCATION

Indian Institute of Technology Ropar, Punjab, India — *anticipated 2017 - 2021*
Bachelor of Technology
Electrical Engineering and Computer Science — **Current GPA:** 8.06/10

Ryan International School, Jaipur, Rajasthan — *2017*
Central Board of Secondary Education - AISSCE(Class 12)
Computer Science, Physics, Chemistry, Mathematics, English — **Score** : 94%

WORK EXPERIENCE

FullCircle LLC | *Algorithm Engineer/UX Engineer* — *Aug 2020 - present*
Atlanta, GA 30350 USA — *Contract*

- Developed recommendation algorithms to match helpers to users that need help based on the provided query statement.
- Conducting user-feedback studies for quick updates and guide the further direction of development for the platform.
- Incorporated various psychological and digital footprint factors to deliver better user matching. Manage instances of the algorithms using AWS.
- Provided insights into app flow development to improve usability, design affordances, and incorporate usage analytics. Responsible for designing and prototyping the UI for the application.
- Leveraged non-intrusive smartphone data to analyze factors that affect mental well being of students.
- Handle Search Engine Optimization for the main website.

AWaDH, IIT Ropar | *Graphic Designer* — *November 2020*
Rupnagar, Punjab, INDIA — *Volunteer*

- Agriculture and Water Technology Development Hub is a recently established Technology Innovation Hub under the Department of Science and Technology by the Government of India.
- Was responsible for designing multiple logos and certification template for the hub.

RMML, IIT Ropar | *Software Development* — *July - Aug 2020*
Rupnagar, Punjab, INDIA — *Volunteer*

- Developed an essential cross-platform desktop utility tool from scratch for lab-researchers at Mechanics of Materials Lab using python that enables easy extraction of tables from text-based PDF files and converts them into CSV files.
- Developed scripts for implementing cursor-based selection and extraction of text while maintaining structural information of tables from PDF pages.
- Engineered the UI using wxpython GUI framework focusing on usability.Open source link:

College of Engineering, National Chung Cheng University | *Research Intern* — *May 2020*
Chia-Yi County, Taiwan (ROC) — *Internship*

- Accepted internship offer with full scholarship. Topic : Content-Aware 360-degree Video Encoding.
- Cancelled due to COVID-19.

RESEARCH EXPERIENCE

Google Research India AI Summer School *August 2020*

- Attended Google AI Summer School, a 3-day conference, where qualified students engage with research leaders in the field of Human-Computer Interaction, AI for Social Good, Natural Language Processing, and Multi-Agent Systems.
- Discussed cutting-edge research and engaged in critical questions of robustness, use cases, and ethical concerns about the methodologies in development.

Video Summarization Using Reinforcement Learning With Attention *Aug - Dec 2020*
CP302 Capstone Project, Guide: Dr. Subrahmanyam Murala

- Designed a method for video summarization that incorporates a self-attention mechanism to generate importance scores for the frames to generate video summaries.
- Used Reinforcement Learning in the form of REINFORCE policy gradient method with a diversity-representativeness reward to train the model.
- Employed the rank comparison method "Kendall's tau" as a means to compare generated summaries in addition to the generic F-score metric, enabling more meaningful comparison between various methodologies.

Exploring the Scope of Diversification of Wasteland Usage *November 2019*
HS202 Human Geography and Societal Needs, Guide: Dr. Devaraj P.

- Analysed the impact of barren and vacant land in Indian villages.
- Investigated possible reasons for this phenomenon and suggested plausible solutions to help tackle this problem in Dekhwala, our model village.

TECHNICAL PROJECTS

Skeletal Animation in PyOpenGL *December 2020*
CS515 Computer Graphics

- Implemented the complete graphics pipeline for rendering a Collada(.dae) file, including the model, texture mappings, keyframes, and bone information.
- Implemented the interpolation between different keyframes using linear and quaternion models for translations and rotations, respectively.

Through The YouTube Rabbit Hole *November 2020*
CS522 Social Computing

- Productive usage of YouTube requires the user to have continuous self-control to stay on the relevant topics and not be lured away into watching irrelevant content - which generally makes the user feel exhausted, inefficient, and frustrated.
- Empirical analysis of how the dissimilarity of content decreases as users go down the trail of recommended videos on the popular video streaming site, affirming the rabbit-hole phenomena' existence.

Music Harmonization Using Reinforcement Learning *November 2020*
CS533 Reinforcement Learning

- Modelled melody-based harmony generation in the form of states, actions, values, and rewards.
- Trained an artificial neural network to represent the value function using a modified SARSA algorithm that considers the immediate past action in addition to the current state.
- Sourced the training data from MIDI files representing a compilation of popular music. Best results achieved rewards that were 11.09 times the expected rewards for a random choice.

GradCAM Implementation *September 2020*
CS504 Artificial Neural Networks

- Utilized the pre-trained InceptionV3 to carry out transfer learning on the P29-Cross-Pure-Dogs dataset. Managed to achieve a test-set accuracy of 85.9%.
- Implemented the Grad-CAM methodology by Selvaraju et al. to visualize regions of the test image that are seminal to the classifier's output.

RISC-V Emulator *Jan - June 2020*
CS204 Computer Architecture

- Developed a RISC-V Instruction Set Architecture emulator from scratch in C++.
- Implemented 1st order prediction pipeline, memory access, and cycle updates.

CMOS Sound Synth *November 2019*
Analog Devices Lab

- Designed and built a sound synthesizer circuit to compose electronic music using generic analog ICs(OpAmps, Inverters, Mux, Demux).
- Incorporated a pattern arpeggiator circuit with controllable frequency parameters.

OTHER PROJECTS

Residential Customer Load Pattern Recognition Techniques *June 2020*
EE309 Power Systems

- Conducted a literature survey and analysis of different load monitoring techniques as a local smart grid component.

Deep Neural Networks for Precision Farming *June 2020*
GEXXX Development Engineering

- Discussed the development of a Deep Neural Network that would facilitate mapping the locations of weeds in an organized agricultural setting for selected herbicide and stomp machines.

The Survival and Ethics of Humanity as a Hive Mind *October 2019*
HS104 Professional Ethics

- Essay on the future of AI in the context of the posthumanist idea of a hive mind.

TECHNICAL COMPETENCIES

Programming	Python, C, C++, MATLAB , RISC-V Assembly
Web Development	HTML, CSS, JavaScript, Flask, SQLite, PostgreSQL, AWS RDS
Frameworks	Tensorflow, WXPython, PyTorch
Prototyping	Arduino, Figma, Adobe XD, Machine Shop Tools
Creative	Photoshop, Illustrator, Lightroom, LogicPro X

PROFESSIONAL DEVELOPMENT

Deep Learning Specialization *April-July 2020*
DeepLearning.AI

- Taught by: Andrew Ng, Kian Katanforoosh Teaching Assistant - Younes Bensouda Mourri

Graphic Design (Honors) *April 2020*
University of Colorado Boulder

- Taught by: David Underwood

EXTRACURRICULAR

Alankar Music Society, IIT Ropar *2019 - 2020*
Mentor

- Oversaw the finances, memberships of students, maintenance of infrastructure and equipment, participation in events from the society.
- Mentored and trained the sophomore representatives of the club for taking up leadership roles.

Alankar Music Society, IIT Ropar *2018 - 2019*
Coordinator

- Conducted sessions for members on music theory and lessons for specific instruments.
- Trained freshers for stage performances at various events.

Coding Club, IIT Ropar *2018 - 2019*
Coordinator

- Conducted sessions on competitive coding - discussed problems, algorithms, and solutions to doubts every week with a class of 50 freshers.
- Hosted local coding competitions for freshers.

Monochrome-Graphic Design Club, IIT Ropar *2018 - 2019*
Instructor

- Designed Posters, Banners, Graphics for Institute Events.
- Conducted lessons and seminars on Graphic Design methods and tips for freshers.

BAJA SAE India, IIT Ropar *2018*
Team Lead | Timing and Race Control

- BAJA SAE India is a mega Off-Road racing event for student-designed vehicles.
- Led a team of 10 people to manage and keep a log of race including timings, distances, laps, and penalties for the events of Sledge Pull(12 hrs) and Endurance(12 hrs) events.

RELEVANT COURSES

Social Computing	Computer Vision	Data Structures and Algorithms
Computer Graphics	Operating Systems	Digital circuits
Artificial Neural Networks	Database Systems	Analog circuits
Reinforcement Learning	Control Engineering	Probability and Stochastic Processes

ACHIEVEMENTS

2020 Received an honorarium for designing the logo and certificate for Agriculture and Water Technology Development Hub. Designs were selected out of 13 candidates.

2020 Accepted in Google Research India AI Summer School 2020 as one of the 150 participants out of 10,000+ national applicants signifying strong research potential.

2019 Accepted into the Computer Science minor program at IIT Ropar as one of the 20 students based on merit.

2017 Secured All India Rank 3939 in JEE Advanced 2017 out of 160,000 candidates.

INTERESTS & HOBBIES

Cycling	Music Production	Cooking	Photography
Playing Instruments	Graphic Designing	Trekking	Repairing