

# ARPON KAPURIA

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## Summary

A recent graduate in Computer Science with a deep passion for technology, research, and teaching. My goal is to inspire the next generation of learners and contribute to the development of cutting-edge solutions in fields like computer vision and natural language processing. Outside of this, I enjoy traveling and solving problems on LeetCode.

## Education

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| <b>National Institute of Technology, Tiruchirappalli</b><br>B.Tech in Computer Science & Engineering   CGPA 7.75/10 (First Class) | <b>December 2020 – June 2024</b><br><i>Tamil Nadu, India</i> |
| <b>Kushtia Government College, Kushtia</b><br>Science   GPA 5/5   | <b>2019</b><br><i>Kushtia, Bangladesh</i>                    |
| <b>Kushtia Zilla School, Kushtia</b><br>Science   GPA 5/5   | <b>2017</b><br><i>Kushtia, Bangladesh</i>                    |

## Relevant Courseworks

- Linear Algebra and Calculus
- Data Structures and Algorithms
- Operating Systems
- Computer Networks
- Database Management Systems
- Augmented and Virtual Reality
- Deep Learning
- Image Processing and Applications
- Natural Language Processing

## Experience

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| <b>Centre for Global Studies, Bangladesh (Part-Time)</b><br>IELTS Instructor | <b>October 2024 – Present</b><br><i>Kushtia, Bangladesh</i> |
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- Design and deliver customized IELTS lessons for all modules, providing targeted feedback, strategies and counselling to help students improve their band scores.

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| <b>Indian Institute of Technology Bombay</b><br>Research Intern   MeDAL Lab | <b>May 2023 – July 2023</b><br><i>Mumbai, India</i> |
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### Project 1: Enhancing Self Supervised Learning framework - BYOL

- Conducted an extensive literature survey on self-supervised learning, emphasizing contrastive learning principles and frameworks like simCLR, MoCo, and BYOL.
- Reproduced the BYOL and simCLR framework using PyTorch, replicating the original work to establish a solid foundation for subsequent modifications.
- Introduced innovative changes to BYOL, such as formulating a new algorithm, incorporating a novel loss function, and architecture adjustments for a better representation learning. Hyperparameter tuning was conducted to optimize the training procedure.

### Project 2: Radiology DICOM Image Anonymization

- Created a user-friendly system for DICOM image upload and processing using Flask, along with a Python script using Pydicom for efficient anonymization, addressing medical data privacy concerns.
- Performed a testing using the CRAFT model for text detection and extraction from X-ray images, enhancing the interpretability and utility of medical imaging data.

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| <b>National Institute of Technology Tiruchirappalli</b><br>UG Research Assistant   Industrial Automation Lab | <b>October 2022 – February 2023</b><br><i>Tiruchirappalli, India</i> |
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### Project: Centralized Power Cluster Home Automation

- Developed a Flutter app to automate the operations and billing for a power cluster in Assam, India, serving 200 homes.
- Integrated Flutter front-end with API developed in Django and used an MQTT server for IoT communication.
- This project was supported by Department of Science & Technology, and Ministry of Science and Technology, Govt. of India under the project SUSTENANCE (*Sustainable Energy System for Achieving Novel Carbon Neutral Energy Communities*).

# Projects

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## NoSmokeZone – AI for Smoker Detection in Public Spaces

December 2023 – January 2024

Python, TensorFlow, Keras, OpenCV

- Automated a real-time smoker detection system with minimal human intervention leveraging advanced CNN models (EfficientNetV2, VGG16, ResNet-50) and Vision Transformer, achieving 93% accuracy.
- Fine-tuned models and applied data augmentation techniques, enhancing robustness and reducing false positives/negatives by 7% compared to baseline models, significantly minimizing misclassifications.

## 9 Box Puzzle - Android App

December 2022

Java, Android Studio, A\* Algorithm

- Designed and programmed an engaging 9-puzzle game in Java, featuring a 3x3 grid of numbered boxes from 1 to 8, with a missing 9th box in random order.
- Provided comprehensive in-app resources, including a home menu, how-to-play guide, optimal solution visualization, and a performance tracking system for user statistics and puzzle difficulty based on the minimum moves required.
- The optimal solution window displays step-by-step moves needed to solve the puzzle most efficiently, utilizing an AI-based algorithm (A\* Algorithm).

## Malicious Website Detection Using Machine Learning

September 2022 – November 2022

Python, Flask, JavaScript, Chrome Extension tools

- Implemented a machine-learning model with around 94% accuracy to detect malicious websites.
- Trained and compared various classification algorithms, including supervised and neural network-based methods, to achieve a robust performance.
- Built a chrome extension using JavaScript to extract the features from the webpage to test the website against the trained model to classify if it is malicious or not. Added a feature to receive user feedback.
- Adopted a continual learning approach to store the user feedback and retrain the model daily to improve performance.

# Skills

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**Programming Languages:** C, C++, Python, Dart, JavaScript, SQL

**Frameworks:** PyTorch, LangChain, Flask, Flutter, Unity

**Miscellaneous:** Linux, Docker, Git, VS Code, Android Studio, Google Colab, Latex

**Languages:** Bengali (Native), English (Advanced), Hindi (Verbal), German (A1.1)

**Standardized Test Scores:** GRE - 307, IELTS - 7.5 (2024)

# Achievements

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- 2020** Recipient of the prestigious ICCR Scholarship by the Ministry of External Affairs, Govt. of India, for fully funded undergraduate studies, awarded for academic excellence and promoting cultural exchange.
- 2017** SSC Board Merit Order Scholarship from the Chamber of Commerce, Kushtia, Bangladesh.
- 2015** JSC General Grade Scholarship from the Government of Bangladesh.
- 2012** 1st position, Zilla Shilpakala Academy Kushtia organized Art competition for Independence Day.
- 2011** 2nd position, Bangladesh Udichi Shilpigoshthi Kushtia organized Art competition for Bengali New Year ' 1418.

# References

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1. Dr. M. Brindha  
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2. Amit Sethi, PhD  
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