**Guidelines for Project Report**

After completion of the project work, every student will submit a project report which should contain the following:

1. **Cover Page** (as per annexure 1)
2. **Title page** (as per annexure 1)
3. **Declaration by the Student** (as per annexure 2)
4. **Acknowledgement** (The candidate may thank all those who helped in the execution of the project.)
5. **Abstract** (It should be in one page and include the purpose of the study; the methodology used and a summary of the major findings.)
6. **Table of Contents** (as per annexure 3): Detailed description of the project (This should be split in various chapters/sections with each chapter/section describing a project activity in totality). This portion of report should contain all relevant diagrams, tables, flow charts, software programme, print outs, photographs etc., which are properly labeled.

#### Conclusion & Recommendations

1. **Appendices** (if any)
   * Appendices are provided to give supplementary information, which if included in the main text may serve as a distraction and cloud the central theme.
   * Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2.
   * Appendices shall carry the title of the work reported and the same title shall be listed in the Contents page also
2. **References** (The listing of references should be typed 2 spaces below the heading “REFERENCES” in alphabetical order in single spacing left – justified. It should be numbered consecutively (in square [ ] brackets, throughout the text and should be collected together in the reference list at the end of the report. The references should be numbered in the order they are used in the text. The name of the author/authors should be immediately followed by the year and other details). Typical examples of the references are given below:

#### REFERENCES

[1]. Ariponnammal, S. and Natarajan, S. (1994) ‘Transport Phonomena of SmSel – X Asx’, Pramana – Journal of Physics Vol.42, No.1, pp.421-425.

In addition, following points should be complied with:-

1. Page numbering
2. Numbering of appendices, figures and tables and their reference in the text.
3. For general layout of report, any standard text book layout may be referred.

#### Report Specifications:

1. Project Report’s Cover Type: **PDF-File only**
2. Number of Copies: **1 per student**
3. Paper Size (orientation): **A4** (portrait)

#### Margins: 1” top / bottom / right and 1.5” left

1. Font Type: **Times New Roman**
2. Font Size: **16 bold for chapter names**, **14 bold for headings** and **12 for normal text**
3. Line Spacing: **1.5 throughout**
4. Page Numbering: For introductory pages like Acknowledgment, Declaration, List of Tables, List of Figures, List of Symbols, List of Abbreviations ---Refer to the relevant Appendices. For the remaining file--- Bottom center of page in the format – **Page 1 of N**

**NOTE:** Project report must not contain any description of the following except only a relevant and short mention – technology or platform or OS or tools used or any language details. It must be more focused on project work carried out and its implementation details without including any source code.

**COVID-19 DETECTION USING**

**CONVOLUTIONAL NEURAL NETWORK**

**Review Paper**

### A Project Work

*Submitted in the partial fulfillment for the award of the degree of*

# BACHELOR OF ENGINEERING

### IN

### COMPUTER SCIENCE and ENGINEERING

### With Specialization in

### Artificial Intelligence and Machine Learning

### Submitted by:

### MANASIJ HALDAR

### 20BCS6838

### Under the Supervision of:

### PRABHJOT SINGH MANOCHA



# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING APEX INSTITUE OF TECHNOLOGY

### CHANDIGARH UNIVERSITY, GHARUAN, MOHALI - 140413,

**PUNJAB**

#### MAY, 2022

**DECLARATION**

I, **Manasij Haldar**, student of **Bachelor of Engineering in Computer Science and Engineering with Specialization in Artificial Intelligence and Machine Learning**, **session:2020-2024**, Department of Computer Science and Engineering, Apex Institute of Technology, Chandigarh University, Punjab, hereby declare that the work presented in this Project Work entitled ‘**Covid-19 Detection using Convolutional Neural Network’** is the outcome of our own bona fide work and is correct to the best of our knowledge and this work has been undertaken taking care of Engineering Ethics. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

#### Date: 4/20/2022

**Place: Chandigarh University, Mohali, Punjab, India**

### Manasij Haldar

### Candidate UID: 20BCS6838

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## Abstract

*In early December 2019, A novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was responsible for the Coronavirus Disease 2019 (COVID-19) outbreak in Wuhan, Hubei Province, China. On January 30, 2020, the World Health Organization designated the outbreak as a Public Health Emergency of International Concern. The emergence of COVID-19 in 2020 has been a historical moment. This virus has spread to many countries and rendered many people housebound. Many studies have attempted to examine the impact of this pandemic from various angles; however, this study will focus on how it has affected and may affect children aged 0 to 12 years in the future after schools have been closed for months. As of February 14, 2020, 49,053 laboratory-confirmed cases and 1,381 deaths had been reported worldwide. In response to the perceived risk of contracting disease, many countries have implemented a variety of control measures.*

*We conducted a literature review of publicly available information to summarize what we know about the virus and the current epidemic. This literature review covers the causal agent, pathogenesis, and immunological responses, epidemiology, diagnosis, treatment, and management of the disease, as well as control and prevention efforts.*

*The Coronavirus Disease 2019 (COVID-19) pandemic is still wreaking havoc on the global population's health and well-being. Effective screening of infected patients is a critical step in the fight against COVID-19, with radiology examination using chest radiography being one of the key screening approaches. Early studies discovered that patients with COVID-19 infection have abnormalities in chest radiography images. In this study, we introduce a deep convolutional neural network design tailored for the detection of COVID-19 cases from chest X-ray (CXR) images, motivated by this and inspired by the research community's open-source efforts. For the training, we used various open source*

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*CXR datasets available on the internet to create a larger and more efficient dataset that is now uploaded and available on Kaggle. We present an open access benchmark dataset that we created with around 25,000 CXR images and, to the best of the authors' knowledge, the largest number of publicly available COVID-19 positive cases.*

*In addition, we presented a comparison study of how different transfer learning models make predictions using an explainable method in an attempt to gain deeper insights into critical factors associated with COVID cases, which can aid clinicians in better screening, as well as to validate that it is making decisions based on relevant information from the CXR images. The goal of the study is to provide a better understanding for future COVID-19 or other imagery-based predictive decision-making tasks in terms of selecting the best transfer learning model to achieve the highest accuracy in the operations.*

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## List of Symbols

*Symbol Description*

***Ast Asc Asv b d d’***

***fc,ave fsc***

##### fy Sv xu

***~~x~~***

*τ* ***c***

*Area of steel reinforcement bars on tension face*

*Area Of steel reinforcement bars on compression face Area of two legs of the closed stirrups*

*Breadth of rectangular beam section Effective depth of rectangular beam section Effective cover on compression face Average compressive stress in concrete Stress in steel on the compression side*

*Characteristic strength of steel reinforcement bars Spacing of the stirrups*

*Depth of neutral axis from compression face*

*Depth of centroid of the compression block in concrete Shear strength offered by concrete*

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# INTRODUCTION

#### 1.1

**1.1.1**

1. **LITERATURE REVIEW**

Kim et al. [25] proposed VUDDY, which is a scalable approach for detection of vulnerable code clones. This approach can detect vulnerabilities efficiently and accurately in large software. They able to achieve extreme level of scalability by using function-level granularity and a length-filtering techniques that decreases number of signature comparisons. Most interesting feature of this technique is that it can even detect variants of known vulnerabilities. To achieve extreme level of scalability, they used function-level granularity and length-filtering techniques to reduce number of signature comparisons.

**2.1 Literature Review Summary**

Table 2.1: Literature review summary

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year and citation** | **Article Title** | **Purpose of study** | **Tools / Software Used** | **Comparison of technique** | **Source (Journal / Conference)** | **Findings** | **Data set (if used)** | **Evaluation parameters** |
| 2010 |  |  |  |  |  |  |  |  |

# PROBLEM FORMULATION

During software development, clones can occur in software intentionally or unintentionally. Developers tend to clone fragments of software during development to save efforts and expedite the development process. ........................................

From the literature review, it is observed that studies highlight the need of efficient and scalable approach for detecting code clones having software vulnerability. The existing techniques are not able to detect all types of vulnerable code clones. Different approaches suffer from high false negative rate and not scalable to large software systems due to high time complexity. So firstly, there is a need........................................ Second same subject systems should be used to compare the approaches which detect

# RESEARCH OBJECTIVES

The proposed research is aimed to carry out work leading to the development of an approach for vulnerable code clone detection. The proposed aim will be achieved by dividing the work into following objectives:

* 1. To understand and explore various types of software vulnerabilities existing in open source software.
  2. To study and analyse various clone detection techniques that are suitable for vulnerable code clone discovery.
  3. To design and develop the technique for vulnerable code clone detection.
  4. To verify and validate the proposed system.

# METHODOLOGY

The following methodology will be followed to achieve the objectives defined for proposed research work:

* 1. Detailed study of software vulnerabilities, their types and impact of code cloning practice on software vulnerabilities will be done.
  2. Installation of clone detection tools and hand on experience on existing approaches of clone detection applicable for software code clone vulnerability will be done. Relative pros and cons will be identified.
  3. Vulnerability database will be created, which corresponds to the C/C++ open source projects that have some vulnerabilities according to National Vulnerability Database (NVD) [36] and Open Sourced Vulnerability Database (OSVDB) [51].
  4. Different clone detections techniques will be analysed to figure it out which clone detection technique is appropriate for particular type of vulnerability.
  5. An approach will be developed for vulnerable code clone detection.
  6. Various parameters will be identified to evaluate the proposed system.
  7. Comparison of new implemented approach with exiting approaches will be done.

1. **RESULTS AND DISCUSSION**

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