

Final Report

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| School of Computing  Faculty of Engineering AND PHYSICAL SCIENCES |

Disease Classification in Chest X-rays Using the NIH Dataset

Hammad Shahid

Submitted in accordance with the requirements for the degree of  
BSc Computer Science

2023/24

COMP3931 Individual Project

The candidate confirms that the following have been submitted*:*

*<As an example>*

|  |  |  |
| --- | --- | --- |
| **Items** | **Format** | **Recipient(s) and Date** |
| *Final Report* | *PDF file* | *Uploaded to Minerva (DD/MM/YY)* |
| *Scanned participant consent forms* | *PDF file / file archive* | *Uploaded to Minerva (DD/MM/YY)* |
| *Link to online code repository* | *URL* | *Sent to supervisor and assessor (DD/MM/YY)* |
| *User manuals* | *PDF* | *Sent to client and supervisor (DD/MM/YY)* |

The candidate confirms that the work submitted is their own and the appropriate credit has been given where reference has been made to the work of others.

I understand that failure to attribute material which is obtained from another source may be considered as plagiarism.

(Signature of student) Hammad Shahid

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# Summary

In medical Imaging, accurate diagnosis is crucial for effective. Chest X-rays are common amongst the most common radiological examinations performed for diagnosing various diseases such as thoracic diseases including pneumonia, tuberculosis, and lung cancer. However, the explanation of the diseases relies on expertise of radiologists. Which can lead to human error. Also increasing volume of imaging studies places a burden on radiological departments, leading to longer wait time for diagnosis. In this individual project I will be developing methods and algorithms which can be used by others to detect various diseases more effectively.

# Acknowledgements

I would like to thank my project supervisor Nabi Omidvar for his support and guidance through this project.

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# Chapter 1 Introduction and Background Research

## 1.1 Introduction

<A brief introduction suitable for a non-specialist, *i.e.* without using technical terms or jargon, as far as possible. This may be similar/the same as that in the 'Outline and Plan' document. The remainder of this chapter will normally cover everything to be assessed under the `Background Research` criterion in the mark scheme.>

## 1.2 Literature Review

<This section heading is purely a suggestion -- you should subdivide this chapter in whatever manner you think makes most sense for your project. It may also make sense to spread the `Background Research' over more than one chapter, in which case they should be named sensibly.>

# Chapter 2 Methods

<Everything that comes under the `Methods' criterion in the mark scheme should be described in one, or possibly more than one, chapter(s).>

## 2.1 Table example

|  |  |  |
| --- | --- | --- |
| **Heading One** | **Heading Two** | **Heading Three** |
| 1.1 | 1.2 | 1.3 |
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| 12.31 | 12.32 | 12.33 |

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**Table 2.1** This is the table description in the ‘table description’ style.

## 2.2 Figure example

Figures can be added using the Illustrations section of the Insert tab.



**Figure 2.1** This is the figure description in the ‘figure description’ style.

# Chapter 3 Results

<Results, evaluation (including user evaluation) *etc*. should be described in one or more chapters. See the `Results and Discussion' criterion in the mark scheme for the sorts of material that may be included here.>

# Chapter 4 Discussion

<Everything that comes under the `Results and Discussion' criterion in the mark scheme that has not been addressed in an earlier chapter should be included in this final chapter. The following section headings are suggestions only.>

## 4.1 Conclusions

<Text in 11-point size and 1.5 line spacing.>

## 4.2 Ideas for future work

<Text in 11-point size and 1.5 line spacing.>

# List of References

*<It is expected that the list would reflect the breadth and depth of scholarly research undertaken by the student during the course of the project.>*

# Appendix A Self-appraisal

<This appendix must contain everything covered under the ’self-appraisal’ criterion in the mark scheme. Although there is no length limit for this section, 2-4 pages will normally be suﬃcient. The format of this section is not prescribed, but you may like to consider the following sections and subsections.>

## A.1 Critical self-evaluation

## A.2 Personal reﬂection and lessons learned

## A.3 Legal, social, ethical and professional issues

<Refer to each of these issues in turn. If one or more is not relevant to your project, you should still explain *why* you think it was not relevant.>

### A.3.1 Legal issues

<Discussion of legal issues>

### A.3.2 Social issues

### <Discussion of social issues>

### A.3.3 Ethical issues

### <Discussion of ethical issues>

### A.3.4 Professional issues

<Discussion of professional Issues>

# Appendix B External Materials

<This appendix should provide a brief record of materials used in the solution that are not the student's own work. Such materials might be pieces of codes made available from a research group/company or from the internet, datasets prepared by external users or any preliminary materials/drafts/notes provided by a supervisor. It should be clear what was used as ready-made components and what was developed as part of the project. This appendix should be included even if no external materials were used, in which case a statement to that effect is all that is required.>