Proforma

Name

College

Project Title

Examination

Word Count

Project Originator

Supervisor

Original Aims of the Project

Describe what solution should do (1 paragraph)

Work Completed

Describe code structure and libraries used

OR

Give tasks completed during project

Special Difficulties

None

Declaration

Look this up in pink book

Contents

List of Figures

Acknowledgements

Thank peeps

Chapter 1

Introduction

Describe project aims

1.1 Motivation

Discuss uses for sound separation and need for this solution
    Mention Hadamard's conditions and ill-posed problem

1.2 Overview of Sound Separation

Describe forms of sound separation
    Specify parameters of problem being considered and explain why
    Published literature - following work of J. Bloggs

1.3 Current Implementations

Say what Melodyne does and other music-oriented piece
    Beamforming?

1.4 Overview of the Dissertation (Optional)

Sentence on each section of the dissertation

Chapter 2

Preparation

Brief statement about design choices

2.1 Choice of Overall Process

Describe general flow of data through solution + reasons
- Alternative(s) - no features?
- Comment on human process

2.2 Choice of Features

Define sinusoidal trajectories
- NMF and matrix factors
- Other possible feature?
- STFT vs Wavelets

2.3 Choice of Implementation

Mention typical code examples (i.e. MATLAB)
- Discuss usefulness of Object-Oriented style
- Final choices for style and platform
- Libraries used

2.4 Software Engineering Approach

2.4.1 Requirements

Required actions in the project
- Features of solution

2.4.2 Software Development Process/Methodology

Originally planned as waterfall
- Result was spiral/incremental, I guess?

2.4.3 Version Control and Back-up

VCS and back-up

2.4.4 Testing

Acquisition and use of samples

Generation of synthetic sounds

Metrics of evaluation - cosine similarity of final audio data; similarity of spectrograms?

Chapter 3

Implementation

Contents of solution and how to use it

3.1 Signal Transforms

STFT, iSTFT
- Problems encountered in making them

3.2 Sinusoidal Trajectories

Point structure
- Trajectory structure
- Distance measurements
- Problems

3.3 Matrix Factorisation

NMF implementation (Lee and Seung)
- Distance measurements
- Problems

3.4 Clustering Algorithms

Hard clustering
- Soft clustering
- NMF
- Problems

3.5 Additional Features

File handling
- Thresholding
- Phase consistency
- Noise splitting

3.6 Tests

Unit tests
    Parameter optimisation

3.7 Software Engineering Practice

Comment on how methodology changed
    Library use, documentation, code structure
    Comment on schedule

Chapter 4

Evaluation

Statement about contents of chapter

4.1 Method Comparisons

Metric definitions
    Test sets

4.1.1 Sinusoids vs. NMF

4.1.2 Hard vs. Soft vs. Matrix vs. Naive Clustering

4.1.3 Addition of Noise

4.2 Case Analysis

Describe chosen final solution for further analysis

4.2.1 Performance Against Noise

Varying noise level
    Varying threshold without noise

4.2.2 Performance Against Stereo Separation

4.2.3 Performance Against Frequency Offset

4.2.4 Synthetic Pathological Cases

Chapter 5

Conclusion

Paragraph stating tasks completed over project
- Open questions on topic
- Comment on my workflow during project
- Potential further extensions - UI for assisted clustering
- Use of solutions and state of field

Appendix A

Test Cases

Include spectrograms of examples of typical test inputs, performance tests and pathological cases

Appendix B

Project Proposal

Include original proposal