

# Dissertation Outline

## "Identifying Depression Through Speech"

*Structure based on A-grade Glasgow dissertations (FATA, IDA, GIST)*

---

### Front Matter (~2 pages)

- Title page
  - Abstract (~250 words)
  - Acknowledgements (optional)
  - Table of Contents
- 

### Chapter 1: Introduction (~3-4 pages)

#### 1.1 Motivation

- Depression prevalence and impact (global, UK)
- Limitations of current diagnosis methods
- Why speech as a biomarker?
- The gap: interpretability over accuracy

#### 1.2 Aims

- Identify predictive acoustic features
- Compare read vs spontaneous speech
- Provide interpretable analysis

#### 1.3 Outline

- Brief summary of each chapter
- 

### Chapter 2: Background (~8-10 pages)

#### 2.1 Depression and Speech Production

- Cognitive effects of depression
- How cognition affects speech
- Observable speech changes

#### 2.2 Acoustic Feature Definitions

- Fundamental frequency (F0)
- Energy/intensity measures
- MFCCs and spectral features
- Temporal features

- Voice quality measures
- Standard feature sets (eGeMAPS)

## **2.3 Machine Learning Approaches**

- Traditional methods (SVM, Random Forest)
- Deep learning approaches
- Evaluation metrics

## **2.4 Related Work**

- AVEC challenges and DAIC-WOZ
- The ANDROIDS corpus
- Feature importance studies
- The gap this work addresses

## **2.5 Summary**

---

# **Chapter 3: Design (~4-5 pages)**

## **3.1 Research Methodology**

- Experimental approach
- Justification for methods

## **3.2 Data Selection**

- Why ANDROIDS corpus
- Dataset characteristics
- Ethical considerations

## **3.3 Feature Extraction**

- OpenSMILE pipeline
- eGeMAPS feature set
- Processing steps

## **3.4 Classification Approach**

- Choice of classifiers (SVM, RF)
- Cross-validation strategy
- Evaluation metrics

## **3.5 Feature Importance Analysis**

- SHAP values
  - Permutation importance
  - Statistical tests
- 

# **Chapter 4: Implementation (~4-5 pages)**

## 4.1 Development Environment

- Tools and libraries
- Hardware specifications

## 4.2 Data Processing Pipeline

- Audio preprocessing
- Feature extraction process
- Data storage format

## 4.3 Model Training

- Hyperparameter selection
- Cross-validation implementation
- Training procedure

## 4.4 Analysis Pipeline

- SHAP implementation
  - Visualisation generation
  - Statistical analysis
- 

# Chapter 5: Evaluation (~6-8 pages)

## 5.1 Classification Results

- Overall accuracy
- Per-task performance
- Confusion matrices
- Comparison with baselines

## 5.2 Feature Importance Results

- Top features (read speech)
- Top features (spontaneous speech)
- SHAP summary plots
- Statistical significance

## 5.3 Task Comparison

- Read vs spontaneous accuracy
- Feature overlap analysis
- Task-specific markers

## 5.4 Summary of Findings

---

# Chapter 6: Discussion (~5-6 pages)

## 6.1 Interpretation of Results

- What the features tell us
- Clinical implications
- Scientific insights

## 6.2 Comparison with Literature

- Agreement with prior work
- Novel findings
- Discrepancies and explanations

## 6.3 Limitations

- Dataset limitations (language, size)
- Methodological limitations
- Generalisability concerns

## 6.4 Future Work

- Directions for extension
  - Recommended improvements
- 

# Chapter 7: Conclusion (~1-2 pages)

## 7.1 Summary of Contributions

- Main findings
- Research question answered

## 7.2 Final Remarks

---

# Back Matter

## References

- All cited works (BibTeX)

## Appendices (if needed)

- Full feature list
  - Additional plots
  - Code snippets
- 

# Page Estimates

Section	Pages
Front matter	2
Introduction	3-4
Background	8-10

Design	4-5
Implementation	4-5
Evaluation	6-8
Discussion	5-6
Conclusion	1-2
References	2-3
<b>Total</b>	<b>35-45</b>

*Target: 40 pages (matches Glasgow limit)*

---

## Key Differences from Original Draft

<b>Before</b>	<b>After (A-grade style)</b>
Motivation as chapter	Motivation as section in Introduction
Background = everything	Background = existing work + theory
No clear aims section	Explicit Aims + Research Question
No outline section	Chapter outline included

---

*Updated: February 2, 2026*

*Based on: FATA, IDA, GIST dissertation structures*