

# University of Lincoln Assessment Framework

## Assessment Briefing Template 2024-2025

1. Module code & title	CMP9780M Applied Signal and Image Processing
2. Assessed learning outcomes	<ul style="list-style-type: none"> <li>[LO1] Critically evaluate and apply the theories, algorithms, techniques and methodologies involved in signal and image processing.</li> <li>[LO2] Design and implement solutions to a range of signal and image processing applications and problems, and evaluate their effectiveness.</li> </ul>
3. Assessment title	Assessment 1
4. Contribution to final module mark (%)	50%
5. Description of assessment task	<p>This is Assessment <b>1</b> and is an <b>individual</b> assignment, which assess the signal processing component of this module and consists of smaller subtasks which must all be complete.</p> <p>This part of the assessment requires you to analyse and classify noisy audio signals. You will use various signal processing concepts to analyse the signals included with this assignment, which is available in a zip file on the module's Blackboard site.</p> <p>The zip file contains two datasets from which you <b>MUST</b> choose one: birdsong or heartbeat. There are two classes in each of these datasets. The birdsong dataset comprises the <i>Cardinalis Cardinalis</i> and <i>Melospiza Melodia</i>, whereas the heartbeats dataset includes both normal and abnormal heartbeats.</p> <p>The signals in these datasets are sampled at 22.05kHz (birdsong) and 44.1kHz (heartbeat), which could be verified by reading the supplied .wav files in your chosen development environment. It is beneficial to gain a sense of the signals by listening to them first.</p> <p><b>Analyse the signals using FFT, STFT, and CWT.</b></p> <ul style="list-style-type: none"> <li>Select a few samples from each class of your selected dataset (training data only) to analyse and understand the signal.</li> </ul>

- Analyse the selected signals using FFT, STFT, and CWT, and comment on your results. Your comments MUST include the following:
  - The windowing method and sizes.
  - Signal plots (amplitude versus time duration), frequency plots (power spectral density vs. frequencies), and spectrogram plots (three-dimensional plots of frequency, time, and magnitude squared of the STFT (in decibels)). The power spectral density (PSD) is the Fourier components normalized squared magnitude. The PSD indicates how much power is present in the signal at each frequency.
- Choose and justify the method best suited for analysing the signals, and comment on whether they could be suitable features for a classification task. Provide a brief description of how these features could be utilised in a classification task.

### **The Report**

You must produce a standard report of up to 5 pages, not including appendices which should cover but not limited to the following:

- How your algorithms or pipeline functionalities work, reflecting on why you chose those approaches.
- You must comment on the tools used and critically evaluate any results from each task.
- The performance of your algorithms using appropriate metrics supplied.
- Your discussion should not only focus on success cases, but also failure, including some discussion about possible causes.
- You must provide justification for how the various datasets were enhanced, including pre-processing methods used.
- You must justify and network architectural choices that were used in the development of the custom deep neural networks, and any decision leading to the choice of the pre-trained networks and framework choices.

### Some other considerations:

- Additional marks will be awarded for originality and scientific rigour.
- Any figures should be numbered and have descriptive legends.
- If you include graphs or tables, be sure to use appropriate axis/column/row labels.

### **The Video**

You must record a 3-minute video of your solution. Because the video is short, you must ensure that just the most essential parts of the

	program are captured. <b>It is critical to note that failing to fulfil the video criteria or submit the video will result in module failure.</b>
<b>6. Assessment submission instructions</b>	<p>The deadline for submission of this work on Blackboard is included in the School Submission dates.</p> <p>Your assessment should include a concise report (up to 5 pages – not including Appendices – in PDF format and uploaded to Assessment Item 1 Upload) that describes your work on the above tasks, and a zip file with all the source code, 3-minute video and user generated datasets (uploaded to Assessment Item 1 Supporting Documentation). Other compressed formats (tar.gz, rar, etc.) will <b>NOT</b> be accepted, and it is your responsibility to ensure the zip file is not corrupt before submitting.</p> <p>Please note that, in the report, you also need to include the main source codes in the appendix.</p> <p>You must attend the lectures for further details, guidance, and clarifications regarding these instructions.</p> <p><i>DO NOT include this briefing document with your submission.</i></p>
<b>7. Date for return of mark and feedback</b>	<p>Please see the <b>Hand In Dates.xls</b> spreadsheet.</p> <p><i>Note: all marks awarded are provisional until confirmed by the Board of Examiners.</i></p>
<b>8. Feedback format</b>	Feedback will be provided on Blackboard, along with the assessment mark.
<b>9. Use of Artificial Intelligence (AI) in this assessment</b>	<p>You may <b>NOT</b> use Artificial Intelligence (<b>AI</b>) in this assignment.</p> <p><i>This means that you may not use any AI technologies including Grammarly, CoPilot, QuillBot and others. If you are not sure whether you should be using a particular tool, then ask your module leader first.</i></p>
<b>10. Marking criteria for assessment</b>	A Criterion Reference Grid ( <b>CRG</b> ) is used to evaluate your learning against a set of pre-defined criteria.
<b>11. Additional information (support, advice, tips etc)</b>	<ul style="list-style-type: none"> <li>• For general enquiries about the assessment strategy, please contact the module coordinator.</li> <li>• For other queries about the module content, please contact a member of the delivery team.</li> <li>• Details of the delivery team's office hours can be found on the module site on Blackboard.</li> <li>• You are required to use the provided report template, which is downloadable from the Blackboard site. If you choose to create your template, it must include the sections from the provided template at a minimum.</li> </ul>

<b>12. Important Information on Dishonesty, Plagiarism and AI Tools</b>	<p>University of Lincoln Regulations define plagiarism as '<i>the passing off of another person's thoughts, ideas, writings or images as one's own...</i>'. Examples of plagiarism include the unacknowledged use of another person's material whether in original or summary form. Plagiarism also includes the copying of another student's work'. Plagiarism is a serious offence and is treated by the University as a form of academic dishonesty. For more information on examples of Academic Offences, please see the <b>Academic Offence Guidance</b>.</p> <p>Please note, if you use AI tools in the production of assessment work <b>where it is not permitted</b>, then it will be classed as an academic offence and treated by the University as a form of academic dishonesty.</p> <p>Students are directed to the University Regulations for details of the procedures and penalties involved.</p> <p>For further information, see <a href="http://www.plagiarism.org">www.plagiarism.org</a></p>