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| **CSY3010 19/20 Assignment (DRAFT updated on 20.01.2020)** | | | |
| Date for submission: | 03/05/2020 | Module Tutor:  Signed: | Mu Mu |
| Student Name:  Student ID: |  |  |  |

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| **Assessment Feedback** | | | | | |
| Aspect (& weighting) | Excellent | Very Good | Satisfactory | Needs some more work | Needs much more work |
| **Design and implementation of the user interface (20%)** |  |  |  |  |  |
| **Design and coding of the functionalities (40%)** |  |  |  |  |  |
| **Quality of code in the application to Media Technology (10%)** |  |  |  |  |  |
| **Technical report (30%)** |  |  |  |  |  |

By entering your **name**(s) and **student ID**(s) you are asserting that this submission is entirely your own individual.

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**Demo video link:**

You must select **one of the given assignment topics** as detailed below. Your work should include:

1. Reseach and literature review of the topic and existing solutions/applications. [report]
2. Deisgn specificiations including user interface (e.g., wireframe) and functional description (e.g., architecture, flowchart, etc.). [report]
3. Complete the minimum specifications included in the assignment brief. [code]
4. Develop additional features that are relevant to the selected topic. [code]
5. Select key features and discuss how you implemented them. [report]
6. Testing/evaluation, if applicable. [report]
7. A 5-minute video demo [link included in report]

You must make appropriate **references** to any code borrowed from other sources (e.g., github, Stack Overflow). Completing the minimum specification will support a **passing** grade, hence you are encouraged to work on additional features.

**Topic 1: Use Matlab to develop a sound annotator**

Application scenairo: A post-production company adds voice commentary to a pre-recorded football match.

Minimum specification:

* Import two audio files (one as voice commentary and the other as audio of football match)
* Mix commentary to a specific part of the second audio so that you can hear both commentary and the match.
* Export results as an audio file
* A user interface that supports interactions with software functions.

**Topic 2: Use Matlab to develop an image segmentation tool**

Application scenario: A tool that segment bones from x-ray images to help visual inspection or 3D modelling.

Minimum specification:

* Import an x-ray image file
* Allow users to use and tune image threshholding to contour bone structure
* Export the bone segments as an image file
* A user interface that supports interactions with software functions.

**Topic 3: Video labeling tool**

Application scenario: A tool that helps labelling one or multiple objects in videos to generate dataset for machine learning.

Minimum specification:

* Import a video file
* Allow users define a rectagular bounding box over an object in the videos and label the box with a word
* Export labelling results (e.g., box cooridnates, labels, etc.) as a text-based file (e.g., xml, csv, etc.)
* A user interface that supports interactions with software functions.

**Topic 4: Image compression loss visualisation using Matlab**

Application scenario: DCT-based image compression introduces “artefacts” (such as blockiness and bluriness) that can be visable to human. The tool visualises the compression loss.

Minimum specification:

* Import an image file and compress it using JPEG.
* Detect and measure the level of blockiness (discontinuity across DCT block boundaries)
* Visualise (superimpose) the blockiness on the image
* A user interface that supports interactions with software functions.