**ASSESSMENT AND INTERNAL VERIFICATION FRONT SHEET (Individual Criteria)**

**(Note: This version is to be used for an assignment brief issued to students via Classter)**

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| Course  Title | **BSc (Hons) in Software Development****BSc (Hons) in Multimedia Software Development****BSc (Hons) in Computer Systems and Networks****BSc (Hons) in Business Analytics** | | | **Lecturer Name & Surname** | | Dr. Conrad AquilinaMs. Ruth S. Vella | |
| Unit Number & Title | | CDKSK-503-1908 English II | | | | | |
| Assignment Number, Title / Type | | 1. Literature Review (Home) | | | | | |
| Date Set | | 03 April 2023 | Deadline Date | 30 April 2023 | | | |
| Student Name | Andrea Baldacchino | | ID Number | 349000L | Class / Group | | 6.1A |

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| Assessment Criteria | Maximum Mark |
| KU1.1 Identify relevant and suitable information from secondary academic sources. | 10 |
| KU2.1 Present a suitable introduction to own research field or research statement. | 5 |
| KU2.3 Present a summative conclusion on salient points discussed. | 5 |
| AA2.2 Develop a research idea in the form of a research statement or theoretical/literature review. | 15 |
| SE1.2 Synthesise arguments, ideas and data from secondary academic sources. | 15 |
| Total Mark | 50 |

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| **Notes to Students:** |
| * This assignment brief has been approved and released by the Internal Verifier through Classter. * Assessment marks and feedback by the lecturer will be available online via Classter (<Http://mcast.classter.com>) following release by the Internal Verifier. * Students submitting their assignment on Moodle/Turnitin will be requested to confirm online the following statements:   **Student’s declaration prior to handing-in of assignment**   * I certify that the work submitted for this assignment is my own and that I have read and understood the respective Plagiarism Policy   **Student’s declaration on assessment special arrangements**   * I certify that adequate support was given to me during the assignment through the Institute and/or the Inclusive Education Unit. * I declare that I refused the special support offered by the Institute. |

English II (Level 6)

*Assignment 1: Literature Review*

**Assignment Guidelines**

* This is a **home assignment** of 4 weeks’ duration.
* Research topic ideas/statements which have **not been vetted** by your course tutor prior to the submission date will **not be considered**.
* This assignment must be **uploaded in .doc format** on each group’s respective **Turnitin portal** on the VLE by the cut-off date indicated.
* A **hardcopy** of this assignment must also be presented during your first lecture on the week commencing Monday 01 May 2023.
* You must type your assignment in the respective sections of the template provided.
* **Late submissions or submissions by email will not be accepted.**
* A detailed **rubric at the end of the assignment** indicates how marks are allocated.
* The College operates a cheating/**plagiarism policy** and any copied work will be penalised according to this policy.
* In all tasks, **proper use of grammar, spelling and punctuation is expected.**

**Background to this assignment**

This assignment focuses on the **academic reading and writing skills** that are required for **pre-dissertation research**.

1. You will need to **identify, select, and consult information from** **6-8** **academic sources**, followed by a **proper review of their content**. For the purposes of this assignment, academic sources would be any of the following: scholarly articles from academic databases and journals, dissertations, reports, conference proceedings, and book chapters.
2. A number of the sources selected need to be **actual studies conducted by others**. This is because your literature review should **analyse,** **compare, and discuss approaches/techniques and results** where available.
3. Before starting work on your literature review, present your course tutor with **a short research statement with a clearly defined scope**. Based on your tutor’s feedback, you will be in a position to structure your suggested project topic, modify it, or select another.
4. Your project topic must be **relevant to your area of specialisation** (software, business analytics, networking or multimedia). You should assume that the topic you select could potentially lead to an implementable project leading to a BSc. IT degree. (Therefore, research questions/statements such as: *How will ChatGPT take over human jobs?*, *Why is it important for companies to have proper data back-up solutions?* or *The benefits of e-learning in today’s education* are inapplicable and quite irrelevant to your degree programme in their current form).
5. **Your review should correspond to the template provided on the next page**. Please follow this template for specific word ranges and expected content per section. The use of sub-sections is necessary for better organisation of content.
6. All sourced content and ideas must carry in-text citations (in IEEE format). Avoid direct quoting unless absolutely essential.

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| Name and Surname: Andrea Baldacchino |
| Course programme: Software Development, SWD |
| Title:  Creating an AI digital companion for the elderly to combat loneliness and improve the quality of life. |
| Area of study and research topic being proposed (approx. 50 words)  *Outline the research area/s and clarify the research topic falling within this area.*  The research areas would be Artificial Intelligence’ (AI); Human-Computer interaction (HCI); Machine Learning (ML); and digitizing and preserving emotions (Affective computing).  Developing an AI companion which will use machine learning to create a personalized companion, to combat loneliness and improve the quality of life. This will explore how the design and interaction of such a companion can address social and emotional needs and enhance their wellbeing. |
| Research statement or question/s being addressed (approx. 100 words)  *Define the scope of your research topic by identifying specific issues to be investigated. Explain why it merits investigation.*  The goal of the research is to develop an Artificial Intelligent (AI) digital companion for the elderly that employs machine learning to tailor personalized experiences to reduce loneliness and improve the quality of life for the elderly. Investigating proper implementation of affective computing will enable the companion to understand and respond to social and emotional cues given, the development of machine learning algorithms to analyze data and personalize the experience and designing an affective interface such that the interaction between the user and the interface does not become the detriment to the interaction between them. |
| Background (approx. 200-250 words)  *Provide a suitable introduction to the topic, typically by providing an overview of any specialist terms/concepts associated with the topic. You may also want to mention key developments via a chronological outline.*  In recent years, there has been a growing interest in the usage of Artificial Intelligence (AI) to address societal issues. One such issue is that of loneliness and isolation among the elderly. With an aging population, loneliness has become a significant concern, with detrimental effects on both the physical, and mental aspects of health. Advances in AI technology present a promising solution to this problem by developing digital companions that can interact with the elderly, providing personalized experiences that can combat loneliness and improve their quality of life.  The development of an AI digital companion for the elderly involves several research areas including Artificial intelligence, Human-Computer interaction (HCI), Machine Learning (ML) and affective computing. Affective computing refers to the study and development of systems that can recognize, interpret, and respond to human emotions. In the context of an AI digital companion, affective computing plays a critical role om enabling the companion to understand and respond to social and emotional cues from the user.  This research will focus on developing an AI companion that uses machine learning algorithms to tailor personalized experiences for the elderly. Machine learning algorithms will analyze data to create tailored experiences that address the social and emotional needs of the elderly. Additionally, this research will investigate the design of an effective interface interaction, without detracting from the interactions between the user and the digital companion. |
| Related work (approx. 700-800 words)  *Summarise and compare relevant approaches to the research area. Link a minimum of 3 studies here. Comment on any significant findings from these studies. Remember to use sub-sections.*  Augmented reality-based companions  In the study conducted by Myeon-Gyun Cho [1] investigates the use of augmented reality based virtual pets as a form of companionship for elderly individuals living alone. The study involves the development and testing of a virtual pet application that utilizes ML techniques to create a personalized companion for each user. [1] The study found that the pet application had a positive impact on the participants’ emotional wellbeing, with participants reporting feelings of happiness and companionship  Similarly, [2] the study conducted by Kelly Merrill proposes a more humanoid virtual reality companion, focusing more on the effectiveness social presence.[1] The study shows that the perception of social presence in AI companions is important for establishing a meaningful relationship with users and enhancing their emotional wellbeing.  Both studies [1-2] highlight the importance of a user-centered and personalized design through the immersive HRI systems of augmented reality to create a more immersive experience to address social and emotional needs. Although, in Merrill’s study, [2] the focus lies on building rapport with the participants through dialog to simulate a more human companion using Natural Language Process (NLP), rather than Cho’s [2] study where it seems to replicate a bond of that between an owner and an animal companion, both aiming to alleviate loneliness and improve the quality of life by creating two very distinct companions.  Unfortunately, Merrill’s [2] study was all based on a hypothetical scenario and did not involve the development or testing of any AI companion, and the study only considered the impact on social presence on users’ perception of AI and did not explore other factors that may influence the effectiveness. As for Cho’s work,[1]  the study involved a sample group of 18 participants with no control groups, making it difficult to compare the effectiveness of the Augmented Reality based pet to other intervention methods for loneliness.  Physical robot companion  The work [3] “ARI: the Social Assistive Robot and Companion” discusses the use of socially assistive robots as companions for individuals. The study proposes a socially assistive robot companion that uses machine learning to create a personalized emotional support system for individuals. The robot companion can recognize and respond to the user’s emotional state and provide emotional support and companionship. [3] The study suggests that socially assistive robots have the potential to bridge the social connection from the companion to the user due to its multi-modal expressive gaze, gestures.  Attitude during human-robot interaction  In the study “Exploring Human attitude during Human-Robot Interaction” [4] it investigates people’s attitude during HRI. An experiment was conducted in which participants interacted with a robot in a collaborative task and completed a questionnaire to assess their attitudes towards the robot. The study found that participants’ attitudes were influenced by their perception of the robot’s personality, as well as their prior experience with robots. [4] The authors emphasize the need to for robots to have a clear and consistent personality to establish a positive relationship with users  Further exploration on the interactions between human and robots was conducted by [6] Esterwood and Robert, but on the impact of trust repair during HRI. They investigate the role of attitude in the effectiveness of trust repair strategies, specifically examining the impact of apology and explanation strategies.[6]  The study found that participants responded positively to apology strategies when the robot had a positive attitude, suggesting that attitude has a critical role in trust repair. The process showcases the potential from ML in understanding and analyzing the users’ responses and improving the HCI.  Overall, these studies [4, 6] provide insight into the factors that influence human attitudes, such as [4] considering the emotional and social factors, and [6] the need for the personalized and user-centered design to address the social and emotional needs. |
| Summative conclusion (approx. 100-150 words)  *Provide a suitable conclusion that summarises salient information in relation to your research topic. Focus on techniques and findings, and note which research deserves further study.*  All companions mentioned [1-3] employ machine learning to tailor personalised responses and experiences, and affective computing to understand and respond to social and emotional cues. The related work discusses the use of [1-2] augmented reality-based companions,[3] physical robot companion, and [4, 6] attitude during human-robot interaction. Cho and Merrill [1-2] focus on developing virtual pets and humanoid companions as, respectively, companionship for the elderly individuals living alone, with the former replicating a bond of an owner and an animal companion. Both studies findings emphasize the importance of a user-centered and personalized design. The study of socially assistive robots as companions proposed by[3] Cooper, suggests that their robots can bridge the social connection due to its multi modal gaze and gestures being able to closely mimic the complexity of that of a human. Meanwhile, the studies of [4, 6] human-robot interactions investigated people’s attitude during the interactions with robots were influenced by their perception of the robot’s personality and their prior experiences with robots. As such, the research regarding HRI requires further study as creating an unbiased interaction between the user and the robot would lead to further success rates. |
| References (6-8 academic sources)  *All sources must be cited throughout the document and reproduced in full as IEEE references.*  [1]  M.-G. Cho, “A Study on Augmented Reality-based Virtual Pets for the Elderly Living Alone,” *IEEE Xplore*, Oct. 01, 2021. <https://ieeexplore.ieee.org/document/9620928>  [2]  K. Merrill, J. Kim, and C. Collins, “AI companions for lonely individuals and the role of social presence,” *Communication Research Reports*, vol. 39, no. 2, pp. 93–103, Mar. 2022, doi: <https://doi.org/10.1080/08824096.2022.2045929>.  [3]  S. Cooper, A. Di Fava, C. Vivas, L. Marchionni, and F. Ferro, “ARI: the Social Assistive Robot and Companion,” *2020 29th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, Aug. 2020, doi: <https://doi.org/10.1109/ro-man47096.2020.9223470>.  ‌[4]  A. Sorrentino, L. Fiorini, I. Fabbricotti, D. Sancarlo, F. Ciccone, and F. Cavallo, “Exploring Human attitude during Human-Robot Interaction,” *IEEE Xplore*, Aug. 01, 2020. <https://ieeexplore.ieee.org/document/9223527>  ‌[5]  Mauricio Osorio Galindo and L. A. Moreno, “Creative Composition Problem: A Knowledge Graph Logical-Based AI Construction and Optimization Solution,” *Lecture Notes in Computer Science*, pp. 42–71, Sep. 2020, doi: <https://doi.org/10.1007/978-3-030-72308-8_4>.  ‌[6]  C. Esterwood and L. P. Robert, "Having the Right Attitude: How Attitude Impacts Trust Repair in Human—Robot Interaction," 2022 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI), Sapporo, Japan, 2022, pp. 332-341, doi: 10.1109/HRI53351.2022.9889535 |

END OF ASSIGNMENT

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| Criteria and Total Mark | Category | Marks Not Awarded | Needs Improvement | Satisfactory | Good | Excellent |
| KU1.1  10 marks | *Academic*  *Sources* | Information given is unidentifiable and/or uncited.  No academic sources are used.  **0 marks** | Less than 4 sources and the majority of are not reputable or reliable academic sources of information.  Source information may also be largely irrelevant to research topic.  **1-3 marks** | Between 5-6 reputable sources of information, which may not all be entirely academic.  Some source information may not be entirely relevant to research topic.  **4-6 marks** | Between 7-8 reputable and reliable academic sources of information.  Source information is generally relevant and necessary to research topic.  **7-8 marks** | Eight or more reputable and reliable academic sources of information.  All content retrieved from journal databases or scholarly sources. Information is entirely relevant to research topic.  **9-10 marks** |
| KU2.1  5 marks | *Background* | Background to the literature review is missing or severely underwritten.  No use of specialist terms/definitions.  **0 marks** | Background to the literature review is underwritten and lacks use of specialist terms/definitions.  There is little attempt to provide context.  **1-2 marks** | Background to the literature review meets word requirements but lacks use of specialist terms/definitions.  There is little attempt to provide context.  **3 marks** | Background to the literature review meets word requirements.  Some use of specialist terms/definitions. Context is established.  **4 marks** | Background to the literature review meets word requirements.  Good use of specialist terms/definitions.  Context is established.  **5 marks** |
| AA2.2  15 marks | *Research Statement &*  *Related Work* | Research statement section lacks a well-defined scope or is missing.  Related work section is severely underwritten, is missing or is practically entirely plagiarised.  **0-2 marks** | Research statement section lacks a well-defined scope or does not outline issues.  R  elated work section is severely underwritten, with very limited paraphrasing.  Related work section is only based on one study.  **3-5 marks** | Research statement section is appropriate.  Related work section meets length requirements but has limited paraphrasing or incorrect use of information and citations.  Related work section is only based on two studies.  **6-8 marks** | Research statement section is appropriate.  Related work section meets length requirements and makes good use of paraphrasing. Minor mistakes in language use and citations.  Related work section makes use of three studies.  **9-12 marks** | Research statement section has a well-defined scope and raises the necessary issues.  Related work section meets/exceeds length requirements with extensive and appropriate use of paraphrasing and citations.  Related work section makes use of three or more studies.  **13-15 marks** |
| SE1.2  15 marks | *Evaluate Source Information* | Source information is not grouped by similarity of content into sections.  There is little to no analysis or contrast of source data. Content is merely paraphrased and randomly listed.  No discussion of key approaches and findings present in secondary sources.  **0-2 marks** | Some sectioning of information is present, but content is not entirely grouped by similarity.  Research data mostly lacks analysis or comparison and is simply paraphrased without further evaluation.  No discussion of key approaches and findings present in secondary sources.  **3-5 marks** | Source information is grouped by similarity of content into sections.  Research data is discussed with some attempt at comparison and contrast.  Some discussion of key approaches and findings which are made relatable to the proposed study.  **6-8 marks** | Source information is grouped by similarity of content into sections.  Research data is discussed with a better attempt at comparison and contrast of key ideas.  Good discussion of key approaches and findings which are made relatable to the proposed study.  **9-12 marks** | Source information is grouped by similarity of content into sections.  Research data is fully discussed with constant comparison and contrast of key ideas.  Good discussion of key approaches and findings which are properly linked to the proposed study.  **13-15 marks** |
| KU2.3  5 marks | *Conclusion* | Conclusion is missing, does not provide a summative review of techniques and findings or is severely underwritten, with extensive errors in writing.  **0 marks** | Conclusion is underwritten or does not provide a summative review of techniques and findings.  Link to own topic issues is missing.  **1-2 marks** | Conclusion is of appropriate length and provides a summative review of techniques and findings.  Link to own topic issues is missing.  **3 marks** | Conclusion is of good length and provides a summative review of techniques and findings.  Link to own topic issues is present, to an extent.  **4 marks** | Conclusion is of good length and provides a summative review of techniques and findings.  Link to own topic issues is fully established.  **5 marks** |

\*Marks deducted for under-writing as well as frequent mistakes in language use, lack of cohesion, and syntax. Properly revise your writing before submission.