

# EMPATHY

## Empathic Computing in Human-System Interaction

**Group Project (50 marks)**  
**Technical Paper (20 marks)**

Release Date: January 22, 2024  
Submission Date (Project): March 22, 2024  
Submission Date (Technical Paper): April 5, 2024

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### Learning Outcomes

This project is a venue for the students to achieve the learning outcomes below:

**LO3.** Collaboratively build models of affect and response using machine learning techniques.

**LO4.** Write a technical paper and present results of the project, showing the framework, experiments and the results.

The group project offers you an opportunity to apply what you have learnt in the class. The final outcome will vary depending on the choice of project, but will involve a substantial amount of research and/or development. Projects can take many forms, such as the incorporation of emotion recognition into a prototype software system or app or a research project implementing the latest techniques in machine learning to empathic computing.

### Project Requirements

1. Students need to demonstrate an empathic system with substantial amount of work from empathic elicitation with real users or using existing dataset. Students can decide any domain and technology / language / tool you prefer. Your project must utilize empathic elements and emotional designs that evoke emotions which results in positive user experience.
2. Some sample work can be referred in the following GitHub links:
  - LittleGenius: A Novel & Intelligent Chatbot for Detection & Treatment of Mental Disorders
    - Sun Haowen, Huang Yixuan, Wang Yixuan, Jing Yu, Zhou Zekai [[github](#)]
  - Online multimodal depression detection
    - He Qinxing, Shi Shu, Duan Yuxin, Sun Qicong, Zhu Qianru [[github](#)]
  - Investigating Affective States with Music
    - Akanksha Bansal, Raakhee Sadhnani, Vijaya Tripathi, Wong Zheng Yang [[github](#)]
  - The challenge of Affective Computing on Emotional Support Platform
    - Mia Huong Nguyen, Matthew Yong Chee Xian, Thai Lam Thuy Quyen, Ryan Wong [[github](#)]
  - Emotional 3D Avatar Visualization using Sentiment Analysis Model
    - Zhong Yanbin, Wang Xiaojin, Pan Yijia, Liang Jianheng [[github](#)]
  - Emergency Dispatcher Assistance System (EDAS)
    - Zhi Jun, Jiang Luyu, Hou Xueyu, Xi Jiri [[github](#)]
  - Understanding Sentiment in Memes using Knowledge-Aware Information
    - Matheus Aaron [[github](#)]
  - Sentiment Analysis Dashboard for 2020 US Presidential Election
    - Cheng Lin Pak, Choon Kiat Kang, David Choo, Jia Yun Teo [[github](#)]
  - Investigating Transfer Learning of Affective Computing Models
    - Kong Yan San, Jonathan Soh, Jing Lin, Deng Jingyuan [[github](#)]
  - Emotional Speech Synthesis in English Using GST-Tacotron 2
    - E-Liang Tan, Natalie Loke, Wei Jie Tan [[github](#)] [[github2](#)]

3. Your proposed project should focus on one of the 17 Sustainable Development Goals (SDG). Please refer to this link for more information on SDG: <https://sdgs.un.org/goals>
4. Any references made on any existing codes must be acknowledged. Codes should not be 100% copied, however they can be adopted and modified to suit your requirements. A serious penalty will be given to a plagiarized project.
5. Student needs to write a report in the form of IEEE format paper between 4 to 6 pages. Please refer to the IEEE format paper and download the template at the following link: <https://www.scribbr.com/ieee/ieee-paper-format/>
6. Your technical paper should contain the following sections:
  - I. Introduction
    - Describe the problem domain or topic and highlight the chosen SDG.
  - II. Background / Literature Review
    - Provide a summary of the previous published work related to the topic.
  - III. Methodology
    - Explain in detail the process that you used in data gathering, analysis and interpretation.
  - IV. Results and Analysis
    - Provide the screenshot with explanations.
    - Summarize the strengths and limitations. Provide suggestions for the limitations.
  - V. Conclusions
  - VI. References
7. Best technical paper(s) from every section will be given a chance to publish their paper in SCOPUS indexed journal / conference as identified below:
  - Bandung: Journal of the Global South (Special Issue)  
<https://bandungjournal.springeropen.com/>
  - 24<sup>th</sup> Philippine Computing Science Congress  
<http://ccscloud2.dlsu.edu.ph/>
  - International Conference on Computers, Data Management and Technology Applications (ICCDTA-24)  
<https://isit.org.in/event/index.php?id=2387541>
8. An example of a student technical paper which was presented in INCEBT2023, (<https://www.incebt.umk.edu.my/>) and published in a Springer proceeding: <http://tinyurl.com/2ds9kpj2>

The presentation slides used in the conference: <http://tinyurl.com/54hxscdk>

**Project Title Registration** (Please fill up this form for title approval):

<http://tinyurl.com/5f8hbc9k>

## **Deliverables**

You are to submit the following through AnimoSpace on or before the deadline set by the instructor:

- The executable program (ready to run). This should be in a folder named **app**. If there are additional files needed for the program to run, make sure to include them. Include in this folder the instructions needed to run the program. Include instructions on how to use it as well if it's not intuitive from the program itself like a README.txt file.
- The complete source codes used for the program. Put these in a folder named **source**.
- A .pdf document containing the report in folder named **report**.

These are to be submitted as a single zip file with a filename of the following naming convention:  
**Section\_Project\_<surname1>\_<surname2>\_<surname3>\_<surname4>\_<surname5>**

Example: **S11\_Project\_Cheng\_DeGuzman\_Herrera\_Santiago\_Bautista**

### Project Rubric

Criterion	Weight	Exemplary 4	Accomplished 3	Beginning 1
UX Design	20%	Designs are intuitive, easy to navigate and trigger emotional responses for users.	Designs are intuitive, easy to navigate but trigger less emotional responses for users.	Designs do not support emotional UX.
Data Collection	20%	Analytic ready dataset and sufficient for reasoning. Self-collected dataset is completely curated with reasonable size.	Dataset used for reasoning is satisfactory. Self-collected dataset is curated with reasonable size.	Only the raw dataset was used.
Appropriateness of Emotion Processing Algorithm	30%	The decision to use the algorithm is justifiable by relevant literature, and is appropriate to solve the problem.	The algorithm used is able to solve the problem, but is too complex (may raise towards computational cost issue).	The decision to use the algorithm was random.
Testing and Analysis	30%	The prototype was tested and its performance measured using accepted techniques.	Tests were performed, but the analysis is vague and finding is unclear.	Insufficient analysis of test results is found.
Total	100 %	* To be normalized to 50%		

## Technical Paper Rubric

Criterion	Weight	Exemplary 4	Satisfactory 3	Developing 2	Beginning 1
Abstract	10%	Summary shows the overall purpose of the project.	Summary partially shows the overall purpose of the project.	Summary does not clearly show the overall purpose of the project.	Poorly written summary.
Literature Review	20%	Clear, balanced and in depth review of the relevant literature indicating excellent understanding of the key concepts.	Clear review of the relevant literature indicating limited understanding of the key concepts.	Basic review of the relevant literature indicating less understanding of the key concepts	Minimal review is done.
Data Collection and Methodology	25%	All details pertaining to how data was collected, annotated and preprocessed is documented; supporting figures are included	All details pertaining to how data was collected, annotated and preprocessed is documented	Important points are present but the details are not included	Important points are not included
Quality of Analysis	25%	Clear evidence of understanding of the results. Can attribute the correct causes for the results; supporting research was conducted	Clear evidence of understanding of the results. Can attribute the correct causes for the results; Additional experiments are needed to support the analysis	Analysis is incomplete. Additional experiments are needed to support the analysis	Results cannot be interpreted correctly
Mechanics	20%	Report follows the required format and there are no misspellings or grammatical errors.  Good organization; points are logically ordered	Report follows the required format. It has no more than two misspellings and/or grammatical errors.  Organized; points are somewhat jumpy	Report follows the required format and has more than two misspellings and/or grammatical errors.  Some organization; points jump around	Report does not follow required format and has more than two misspellings and/or grammatical errors.  Poorly organized; no logical progression;
Total	100%	* To be normalized to 20%			

**All the best!**

**Latest update: Jan 31, 2024**