



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

BSc Applied Computing

DeepConnect: An AI-Driven Mobile Platform for Personality-Based Relationship Matching

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Student Name: Mariana Silva Martins

Student ID: 22319931

Lecturer Name: Dr Osman Elgawi

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Task 1 – Ideation and Mind Map

03 July 2026 04:47

DeepConnect: An AI-Driven Mobile Platform for Personality-Based Relationship Matching

Innovation Statement

<https://mm.tt/map/4034800269?t=Ejeha9Cgvf>



Figure 1 Mind map for DeepConnect.

The platform, DeepConnect, seeks to innovate online relationship building by combining the use of artificial intelligence with personality-matching and progress interaction to help reduce appearance discrimination.

The field of Innovation in Applied Computing is about innovating technologies and finding ways through which problems faced by people can be solved. In recent times, innovations in technology have been increasingly embracing the principles of Human-Centred Design whereby technology has been designed with consideration of users' needs and experiences and not technology [8]. This is how the ideation process depicted in the mind map below was guided and DeepConnect was created.

First, we started ideating on new technologies such as AI, Machine Learning, recommendation systems, cloud computing and mobile app development. It has been proven that the use of AI powered recommendation systems can analyze preferences of the user and offer personalized recommendations [1], [2]. Thus there was an idea to look into the potential use of intelligent recommendation systems for the betterment of digital relationship platforms.

Then we shifted our focus towards identifying real-world problem. Although the digital relationship platforms have revolutionized how people get acquainted with each other, many of those platforms rely more on the appearance of a person than his/her personality, values, or even compatibility [4]. According to [3], "Dating applications have become platform-mediated relationship environments in which algorithmic systems play an important role in determining relationship outcomes". Moreover,

according to [5], "these platforms might inadvertently amplify social biases" thus reducing chances for authentic connections.

Rather than creating another conventional dating application, DeepConnect has come up with an interaction approach where personality comes first before physical appearance. At first, users have to fill in personality questionnaire about values, interests, communication approach and relationship goals of the user. Then using AI powered recommendation engine, compatible candidates are recommended based on personality and not on looks.

One of the important characteristics of DeepConnect is its staged relationship development framework. In the early stages of the process, profile pictures are not shown to users as they engage in guided conversations, which are facilitated by AI-generated questions. With further interactions, more information about profiles is gradually unveiled, encouraging users to develop trust and compatibility before considering appearance.

Human-Centered Design principles are also employed in the suggested platform through bettering the quality of digital interactions, instead of increasing their number. AI is meant to assist humans in their decision-making through reliable compatibility recommendations and not to replace individual choice in any way. The research into personality-aware recommendation systems has found out that consideration of personality traits can increase recommendation quality [6], and trust is critical for AI decision-making influencing humans [7].

In addition to its technical innovation, DeepConnect seeks to generate social value through bettering digital relationships, eliminating appearance discrimination, and ensuring ethical use of Artificial Intelligence. Through emphasizing compatibility over speed of matching via appearances, the site fosters deeper connections between people through a systematic interaction process supported by artificial intelligence technology.

In summary, the process of ideation shows how new technologies, Human-Centered Design and social issues can be integrated into creating an innovative computing solution. The mind map below highlights how this process is undertaken from identifying the problem to offering DeepConnect as a solution in the form of an artificial intelligence platform for personality relationship matching. This solution will form the basis of my research proposal in the subsequent tasks.

Task 2 – Aim and Objectives

03 July 2026 04:49

Introduction

The advent of digital relationship platforms has revolutionised the process by which individuals make and form romantic relationships. Despite the ability to meet more people online, these platforms are increasingly geared towards appearance-oriented selection processes and not real interpersonal interactions. [3] suggest that the introduction of dating applications has resulted in relationships being formed on the basis of platform experiences. Furthermore, [4] reveal that users base their first impression predominantly on pictures on the profiles.

While the use of Artificial Intelligence has greatly enhanced personalisation recommendations, AI utilisation in relation to relationship platforms has mainly been used for improving user engagement. [5] explains that algorithmic methods might inadvertently support the current biases present in society. As a result, there has been little investigation of AI in terms of selecting compatibility based on personality traits rather than appearance. This research gap is the basis for the DeepConnect project.

Rather than developing another conventional dating application, this research investigates whether combining Artificial Intelligence, personality-aware recommendation systems and Human-Centred Design can support more meaningful digital relationship formation. This research therefore positions DeepConnect as a research concept rather than a commercial product, focusing on understanding how AI can support more meaningful relationship formation.

Research Question

How can an AI-driven, personality-based relationship matching platform support meaningful relationship formation while reducing appearance bias through Human-Centred Design?

Research Aim

The aim of this research is to investigate the potential of an AI-driven, personality-based relationship matching platform to reduce appearance bias and support meaningful relationship formation through Human-Centred Design and progressive user interaction.

Research Objectives

To achieve the research aim, the following objectives have been identified:

- Conduct a critical review of literature relating to digital relationship platforms, appearance bias and personality-aware recommendation systems.
- Investigate how Artificial Intelligence and recommendation systems can improve compatibility assessment within digital relationship platforms.
- Generate and analyze an interaction model for the DeepConnect concept based on the Human-Centred Design approach and progressive relationship building.
- Investigate the perception of personality-driven relationships by the users through survey-based study.
- Conduct feasibility and social impact analysis of the DeepConnect concept.

Research Philosophy

Research philosophy influences how knowledge is generated and how research is conducted. [9] explain that the selected philosophy should be consistent with the research question and objectives. For this project, **Pragmatism** has been selected because it focuses on practical solutions to real-world problems and allows researchers to combine different methods where appropriate.

This philosophical approach would be especially apt in relation to DeepConnect since it studies not only technological but also human experiences. [1] refer to the possibility of using artificial intelligence to create better personal recommendations. [6] point out that taking into account personal characteristics might help in making recommendation even better. In turn, [8] stress that innovations in the digital world must pay attention to people's needs and experience within the framework of Human-Centred Design.

Research Approach

The Mixed Method Approach will be used for both the quantitative and qualitative data gathering process. Based on [10], using the Mixed Method approach will result in a deeper comprehension of the complex research problem because of the use of diverse sources of evidence.

In this research, the quantitative data gathering process will be used to investigate the attitudes of users regarding appearance-based matching and AI recommendation while qualitative data will be used to understand further insights of their experiences and perceptions.

Literature Search Strategy

A systematic literature review is set to form the theory behind this study. Relevant literature is to be sourced from **IEEE Xplore, ACM Digital Library, SpringerLink, ScienceDirect, and Google Scholar** on Artificial Intelligence, Human-Computer Interaction, recommendation system, and digital relationship platform.

The literature search strings will comprise Artificial Intelligence, Recommendation System, Personality Based Recommendation, Online Dating, Appearance Bias, Human-Centered Design, Trust in Artificial Intelligence and Digital Relationship Platform, using Boolean operators including AND and OR. Academic journals, conference papers, and books from 2020 to 2025 are to be prioritized while other methodologies from previous literature such as [9] will be included where appropriate.

The selection criteria were designed to ensure that the literature reflected recent developments in Artificial Intelligence, recommendation systems and Human-Centred Design while maintaining academic quality. Prioritising peer-reviewed publications helps establish a reliable theoretical foundation for investigating the proposed DeepConnect concept.

Conclusion

The research design presented here is a well-defined framework that enables the researcher to investigate whether Artificial Intelligence can help create meaningful digital relationships based on personality matching using Human-Centred Design principles. This has been achieved by clearly defining the research question, research objectives, and research methods used in this research.

Task 3 – Research Strategies

03 July 2026 04:49

Research Strategies

This section outlines the strategies that will be used to ensure the quality and credibility of the proposed research. Based on the research philosophy and Mixed Method methodology identified in Task 2, the current study will be centered on developing the most suitable strategies for collecting, analyzing data and adhering to ethics. It should be noted that the chosen strategies are expected to guarantee the validity and reliability of the research results while keeping in mind the realistic nature of undergraduate research.

Validity, Reliability, Generalisability and Ethical Considerations

To improve the validity of the research, the questionnaire will be designed directly from the themes identified during the literature review. [9] state that research validity is strengthened when the data collection instrument measures concepts that are closely aligned with the research objectives. Therefore, the questionnaire will include items related to appearance bias, personality-based matching, trust in Artificial Intelligence and user experience, ensuring that the collected data addresses the research question.

Reliability will be enhanced through the use of clear and consistent questionnaire design. The majority of the questions would be based on a five-point Likert scale, which will make it possible for the participants to answer according to the same standards of measurement in the entire survey. Prior to its release, the questionnaire will undergo a trial run among a select number of participants in order to determine any problem with language and technicality, along with the approximate time needed to complete the form [9].

Approximately 30-50 people who have previously used digital relationship platforms will take part in the research. The research will use the method of convenience sampling as it would fit the existing time frame and budget requirements of the project. Although this method makes the implementation of the project easy, it will limit the generalizability of the results due to the possible unrepresentativeness of the sample. This limitation will be taken into account when presenting the results of the research.

There are several ethical issues that need to be discussed. First, since participants will be asked about their experience with digital relationship platforms, their participation will be voluntary. Before taking the survey, they will be required to give an informed consent. All participants will be anonymous, their personal information will not be recorded, and the results of the research will be kept confidential. Participants will be able to leave the research process at any point before submitting their answers.

Research Strategy and Pilot Data Collection

Following the research design discussed in Task 2, data collection will be conducted via an online survey which will be created using Google Forms. The survey incorporates closed and open-ended questions allowing for conducting research using Mixed Methods proposed by [10]. Closed questions will provide quantitative data about the participants' experience with existing digital relationship platforms and perception of personality-based matching by Artificial Intelligence. In addition, open-ended questions will allow for asking participants to elaborate on their opinions and views.

The survey has been structured into four parts: demographic information of participants, experience with existing digital relationship platforms, perception of DeepConnect concept and open-ended questions addressing issues of trust, compatibility and users' expectations. Survey questions have been built based on the core concepts of the literature review, namely appearance bias, personality-based matching, trust in Artificial Intelligence and progressive interaction. These themes correspond to the core issues of the research related to personality-aware recommendation systems [6], trust in Artificial Intelligence [7] and Human-Centred Design [8]. A pilot version of the questionnaire is included in Appendix A.

Pilot Feedback

The pilot questionnaire was reviewed by two participants prior to distribution. Maylanne Silva (undergraduate computing student) commented that the questionnaire was clear, easy to follow and could be completed within a few minutes. Luisa Rosa, who had previous experience using online dating applications, suggested clarifying the description of the DeepConnect concept before the evaluation questions so that participants could better understand the proposed interaction model. In light of this feedback, a short description of the platform was added before Section C.

Data Analysis

The quantitative data will be analyzed through the use of descriptive statistics in terms of frequencies, percentage and mean to discover any pattern in participants' answers. The qualitative data will be analyzed through the process of thematic analysis, whereby similar answers will be sorted out into themes like appearance bias, compatibility, AI trust and user experience among others. This approach to analyzing the data will allow for more comprehensive understanding of the participants' views along with the Pragmatic Mixed Methods research design employed in this study [10].

Conclusion

The selected research strategies provide a practical framework for evaluating the proposed DeepConnect concept. By implementing procedures that support validity, reliability and ethical research practice, the study aims to produce credible findings while recognising the limitations associated with convenience sampling and a relatively small participant group. Together, these strategies provide an appropriate methodological foundation for investigating whether personality-based AI recommendations can support more meaningful digital relationship formation.

Appendix A – Pilot Questionnaire

Appendix A – Pilot Questionnaire

DeepConnect Research Questionnaire

Participant Information

Thank you for taking part in this research.

This questionnaire forms part of an undergraduate research project investigating how Artificial Intelligence (AI) and personality-based matching could improve digital relationship platforms.

Participation is voluntary and anonymous. No personally identifiable information will be collected, and your responses will only be used for academic purposes.

Estimated completion time: **4–5 minutes**

Section A – About You

1. What is your age?

- 18–24
- 25–34
- 35–44
- 45–54
- 55+

2. Have you ever used a digital relationship platform (e.g., Tinder, Bumble, Hinge)?

- Yes
- No

3. How often have you used these platforms?

- Only once
- Occasionally
- Regularly
- Frequently

Section B – Your Experience

Please indicate your level of agreement with the following statements.

(1 = Strongly Disagree | 5 = Strongly Agree)

4. I usually make my first decision about a profile based mainly on photographs.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. Current dating platforms place too much emphasis on physical appearance.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. I would prefer to learn about someone's personality before seeing their photographs.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section C – DeepConnect Concept

Imagine a relationship platform where:

- users complete a personality questionnaire during registration;
- AI recommends compatible matches based primarily on personality and shared values;
- profile photographs remain hidden until both users have progressed through several stages of conversation.

Based on this concept, please indicate your level of agreement.

(1 = Strongly Disagree | 5 = Strongly Agree)

7. I would be interested in using this type of platform.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. Hiding profile photographs during the first stage of interaction could encourage more meaningful conversations.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

9. I would trust AI to recommend compatible people if I understood how recommendations were generated.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section D – Your Opinion

10. What do you think is the biggest limitation of current dating applications?

11. What do you like most about the DeepConnect concept?

12. Is there anything you would improve or change in this concept?

Thank you for your participation.

Poster

DEEPCONNECT: AN AI-DRIVEN MOBILE PLATFORM FOR PERSONALITY-BASED RELATIONSHIP MATCHING

Reducing Appearance Bias through Personality Matching and Human-Centred Design

Mariana Silva Martins | Dr Osman Elgawi

BSc Applied Computing – Changemakers: Creativity and Value Creation (ACCA5033)
University of Wales Trinity Saint David

INTRODUCTION

Digital relationship platforms often prioritise appearance over personality, which can reinforce bias and limit meaningful connections.

This research explores how Artificial Intelligence and Human-Centred Design can be combined to support more authentic and compatible relationships online.



OBJECTIVE

To investigate the potential of an AI-driven, personality-based relationship matching platform to reduce appearance bias and support meaningful relationship formation through Human-Centred Design and progressive user interaction.

METHODOLOGY



Research philosophy: Pragmatism – combines quantitative and qualitative methods to address a real-world problem.



Data collection: Online questionnaire (pilot study) with 15 participants to test clarity and relevance.



Sampling: Convenience sampling.



Data analysis: Descriptive statistics and thematic analysis.



Quality assurance: Reliability checks, validity measures, and ethical data handling.

IDEATION – MIND MAP



RESULTS (PILOT STUDY)

The pilot study provided initial feedback on the questionnaire and concept.

Key feedback:

- Personality is seen as more important than appearance.
- Participants found the questions clear and relevant.
- The idea of personality-first matching was positively received.
- Suggested improvements were noted for future refinement.



15 participants

ANALYSIS

Quantitative data will be analysed using descriptive statistics to identify patterns and trends.

Qualitative responses will be examined through thematic analysis to understand users' perceptions and expectations.

CONCLUSION

DeepConnect has the potential to promote more meaningful online relationships by reducing appearance bias and prioritising compatibility. The study will contribute to understanding how AI and Human-Centred Design can create ethical and user-focused digital relationship platforms.

KEY SOURCES & ACKNOWLEDGEMENTS



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03 July 2026 04:50

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