NAME : Shiann Noriega
STUDENT ID: 816035120

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"I Don't Want To Shoot The Android": Players Translate Real-Life Moral Intuitions to In-Game Decisions in Detroit: Become Human

The research team is composed of experts from various departments at the University of Waterloo, reflecting a multidisciplinary approach to the study of morality in games:

- **Karina Arrambide** (Department of Systems Design Engineering) focuses on systems design and its applications in interactive media.
- **Katja Rogers** and **Cayley MacArthur** (Stratford School of Interaction Design and Business) bring expertise in interaction design and player experience.
- **John Yoon** (Department of English) contributes with a background in narrative and storytelling.
- **Alessandra Luz** (Cheriton School of Computer Science) specializes in computer science and its integration into game research.
- **Lennart E. Nacke** (Stratford School of Interaction Design and Business) is a leader in game user research and the psychology of player experience.

This paper was published at CHI '22 on Human Factors in Computing Systems, held from April 29 to May 5, 2022, in New Orleans, LA, USA.

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ABSTRACT

This publication explores whether in-game moral decision-making is influenced by real-life morality, using Detroit: Become Human (2018) by Quantic Dream as the research medium. The findings reveal that players often apply their real-life morals to in-game choices, though other factors, such as emotional connections with characters, also impact decisions. This study enhances understanding of morality in gaming and offers valuable insights for game developers on incorporating moral dilemmas to enrich player experience.

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METHODOLOGY
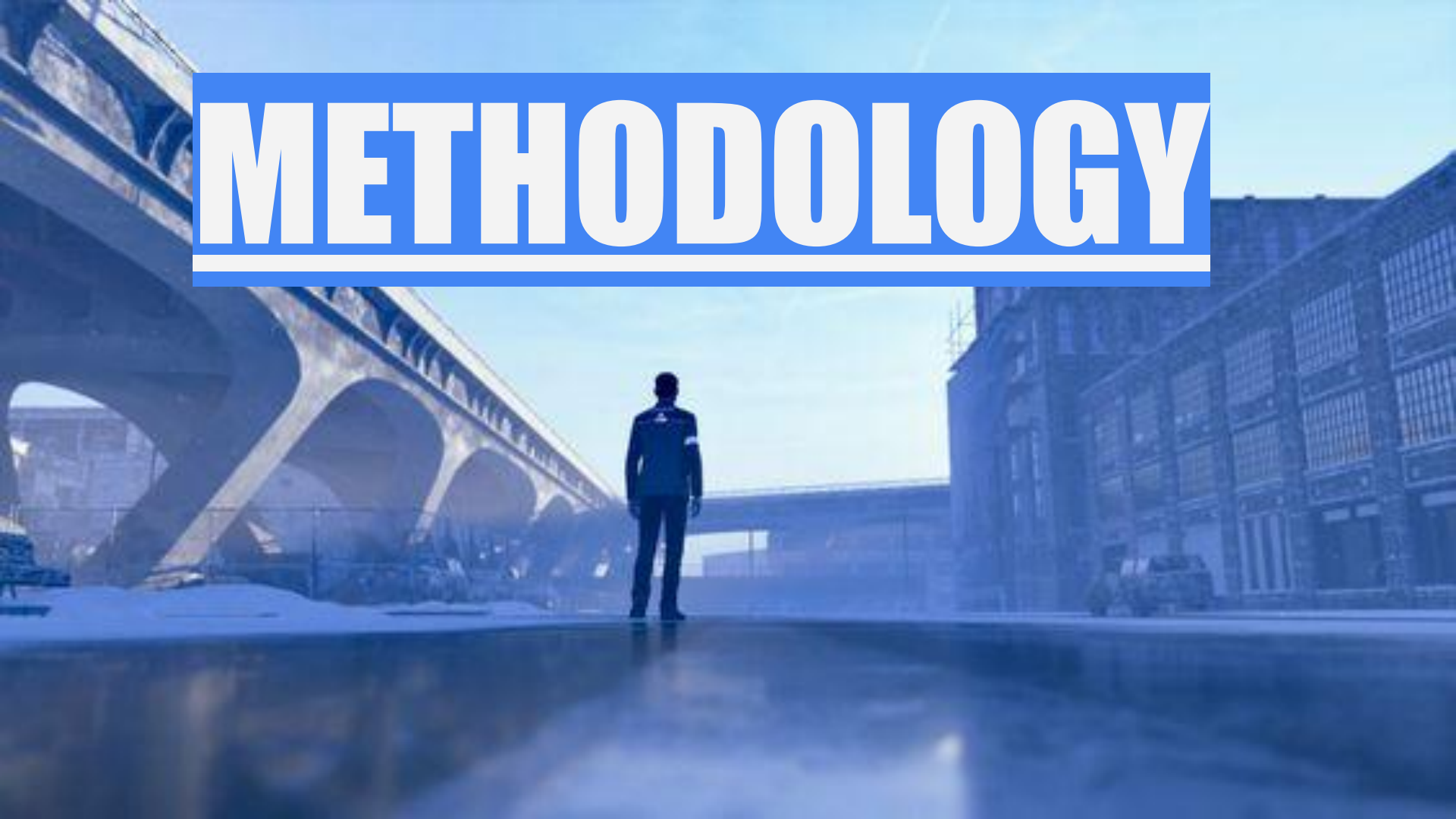
METHOD:

- Participants: 19 gamers (18+ years old) with at least 60% game completion and gameplay within the last 6 months.
- Instruments: Two sets of MFQ30 questionnaires and semi-structured interviews.
- MFQ30 Questionnaire:

    - Part 1 (Relevance): 18 items rated on a 6-point Likert scale (0 = not relevant, 5 = extremely relevant) assessing participants' real-life moral judgments.

    - Part 2 (Agreement): 18 statements rated on a 6-point Likert scale (0 = strongly disagree, 5 = strongly agree) based on moral beliefs.

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- Procedure:
  -Before: Participants completed the first set of MFQ30, focused on real-life morality, before watching a pre-recorded scene from the chapter Meet Kamski.
  - After: Participants answered the second set, assessing the morality of the game character Connor, who spares an android's life in the scene.
- Interview: Participants discussed their real-life morality and experiences with moral decision-making in story-driven games.

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Figure 3: Procedure and experimental design of the study conducted in this paper.

Analysis:

The Braun and Clarke's reflexive thematic analysis approach was used to analyze qualitative interview data, following these steps:

1. **Familiarization**: Raw data from video interviews were reviewed, and initial common themes began to emerge.
2. **Code Generation**: Organic codes were generated to identify recurring patterns in the data.
3. **Theme Search**: Themes were developed and connected to findings, such as players translating real-life morality into in-game decisions.
4. **Theme Review**: Themes were refined by merging similar ones.
5. **Theme Naming and Definition**: Each theme was given a title and definition.
6. **Reporting**: The final themes were detailed in the results section. Dovetail software was used for organizing transcripts and assigning codes.

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Analysis:

Braun and Clarke's approach was followed, which emphasizes the researcher's thoughtful engagement with the data rather than aiming for accurate or reproducible coding across researchers. Reflexive Thematic Analysis focuses on interpretation and patterns, allowing for researcher bias and positionality to influence analysis.

The single coder in this study, with a STEM background and experience in games user research, used their expertise to code transcripts and interpret themes related to morality in interactive narrative games. The coder's previous knowledge, cultural background, and interest in interactive games may have influenced the study design, game selection, and analysis. Additionally, participant responses may have been shaped by social desirability or current events, such as the COVID-19 pandemic.

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RESULTS

Most participants apply their real-life morality in their first playthrough, aligning their in-game decisions with their own values as they see the character as an extension of themselves. Later playthroughs involve experimentation.

Character connection also plays a key role in moral decisions. Participants built emotional bonds with characters like Connor and Hank in Detroit: Become Human, often choosing actions that would protect these relationships and avoid harm.

Players also make moral choices to avoid negative emotions like guilt, striving to be fair and empathetic, just as they would in real life.

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(a) The decision-making mechanic in the game asks players to decide whether to shoot or spare the android, a moral decision.

(b) World statistics showcasing players' choice when presented with the decision of shooting or sparing the android. 85% of players decided to spare the android.

Figure 5: Screenshots from *Detroit: Become Human* [38] showcasing the decision-making mechanic in the chapter *Meet Kamski* where player's assume the role of *Connor*, and must reflect on their morality to select a choice. The second picture reports on world statistics about a moral decision in the chapter, whether to shoot or spare the android.
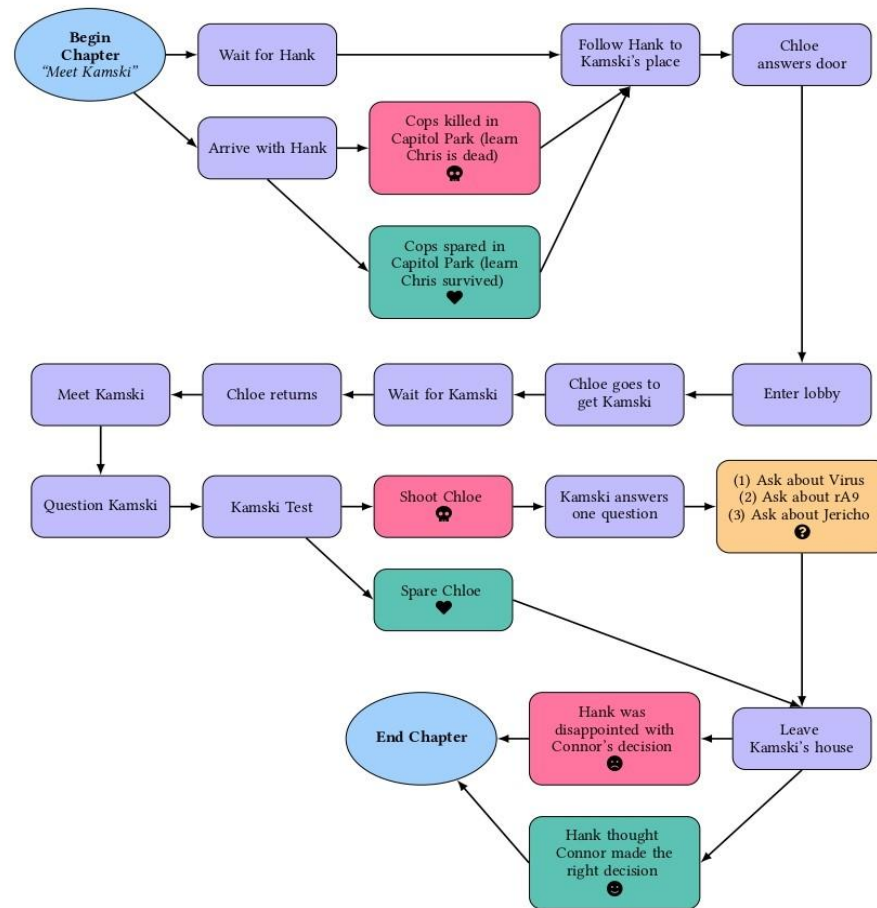
Figure 2: Detroit: Become Human *"Meet Kamski"* chapter. Choices made by the player will create different paths that can have implications in subsequent chapters.

A quantitative analysis was conducted of MFQ30 responses by running Cronbach's α reliability test on both the "Before" and "After" questionnaires. Reliable scores (Cronbach's α ≥ 0.7) were found only for the Harm and Purity subscales. A paired t-test (n = 19) showed no significant difference between "Before" and "After" scores for Harm (p = 0.138) or Purity (p = 0.720). Thus, further analysis on these items was not conducted.

Table 1 highlights the Cronbach's α scores, with reliable data marked by an asterisk. The qualitative analysis was the focus of this study, as the MFQ30's reliability for small sample sizes and repeated use on the same participants remains questionable, a limitation supported by the findings.

Cronbach's α Scores	Before	After
Harm	0.684*	0.811*
Fairness	0.251	0.539
In-Group	0.491	0.496
Authority	0.500	0.655*
Purity	0.778*	0.745*

Table 1: Cronbach's α Scores for each group determined if the data were reliable. Reliable data points are marked with an asterisk*. The MFQ30 items were compared before and after stimulus exposure to the pre-recorded gameplay of the *Meet Kamski* chapter.

DISCUSSION

IMPLICATIONS:

The study offers insights into the representation of moral dilemmas in interactive narrative games, showing that players often apply their real-life morality to in-game decisions. Game designers can use these findings to create narratives that evoke specific emotions based on player choices and moral foundations. Personalized experiences, where players align their characters' decisions with their own moral beliefs, enhance engagement and connection with both playable characters and NPCs. Additionally, the combination of realism and social scenarios grounded in moral foundations can create more immersive and compelling gameplay experiences

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LIMITATIONS:

- There was only one coder for the reflective thematic analysis.Thus, the presented results can be biased by the researchers' perspective.
- The implementation of the MFQ30 with a small sample size. This may have affected the reliability scores negatively as previous research has shown that the majority of the studies using MFQ30 have a higher number of participants.
- The participants already knew the game and previously played it in the last six months. This could affect their perception of characters' morality and the narrative because they already knew the moral dilemmas that were presented in the game.

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LIMITATIONS:

- The study focused solely on an interactive narrative game that relies on decision-making mechanics excluding other gameplay elements like upgrading gear or weapons. This limits the scope of the findings, as they may not be applicable to the other game genres, such as first person shooters(FPS) which also present moral situations.

- The participants only experienced limited game content(i.e the video used in the study only presented one chapter in the game). Although they already had experience with the game, the fact that they may not recall all the chapters can be a limitation in the study.

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LIMITATIONS:

- Participants responses may have been influenced by current events, such as the COVID-19 pandemic.
- The study's focus on participants from English speaking countries(Canada, the US and the UK) introduces a limitation, as race and cultural factors could have impacted the MFQ-30 results.

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CONCLUSION

This study explores how real-world morality influences decision-making in games, addressing the gap in research on players' perceptions of morality and how game elements like realism affect moral choices. A study was conducted with 19 participants, who first reflected on their own morality through the MFQ30, watched pre-recorded gameplay featuring a moral dilemma, and completed a second MFQ30 based on the game character's morality.

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Key findings show that players often apply their real-life morality to in-game decisions during the first playthrough, with subsequent playthroughs driven by experimentation. Moral choices were also influenced by emotional connections with characters, with players tending to avoid choices that might lead to guilt. Additionally, game realism impacted how players approached moral dilemmas.

These insights can help game designers incorporate morality-driven narratives and meaningful experiences. The research also offers valuable contributions to the HCI community by highlighting how users respond to simulated moral dilemmas in games and other systems.

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NAME: Mark Lessey
STUDENT ID: 816032089

WebUI: A Dataset for Enhancing Visual UI Understanding with Web Semantics

Background

This Paper was authored by Jason Wu, Siyan Wang, Siman Shen, Yi-Hao Peng, Jeffrey Nichols, and Jeffrey P Bigham and it was published on April 19th, 2023. The authors Jason Wu, Jeffrey Nichols, and Jeffrey P Bigham also worked on an article Titled "Screen Recognition: Creating Accessibility Metadata for Mobile applications from Pixels" in the 2021 CHI Conference on Human Factors in Computing Systems. Yi-Hao Peng is another author who has multiple publications. He co-authored three other publications at the 2023 CHI Conference which struck approximately 4000 downloads. The other authors are yet to grace the field of HCI with more publications.

Abstract

In this publication, they traversed web pages for the purpose of finding better comprehension of visual UI models through transfer learning techniques, using a plethora of automatically collected web pages. This research, which harboured the creation of a vast dataset of web pages called WebUI, has the potential to enhance the future in creation of visual UI models on the web through analysis of the composed dataset, and a demonstration for the usefulness of the dataset. The findings from this paper show that generally, the data that can be collected from web pages usually can improve performance of pages that have a lack of labeled data for UI.

Methodology

For this research, the dataset that was built utilized an automated cloud-based web crawler for data collection, amassing 400,000 web pages to be used for the analyses. This crawler consisted of a server that kept track of queued and visited websites, a set of crawler workers that scrape URLs with a headless browser, and a database service that stored findings from the crawler workers. Notably, the team assigned a policy to the crawler that established a significance in diversification of the URLs visited. The element detection, screen classification, and screen similarity applications each had their own way of collecting the data necessary.
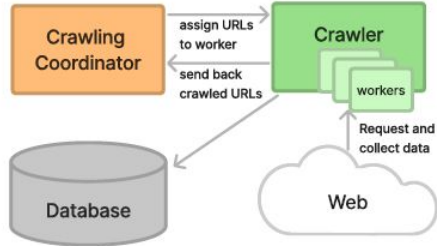
Figure 1: Overview of our crawling architecture. A *crawling coordinator* contains a queue of URLs to crawl and assigns them to workers in a *crawler pool*. Workers asynchronously process URLs by visiting them in a automated browser, scraping relevant metadata, then uploading them to a cloud database.
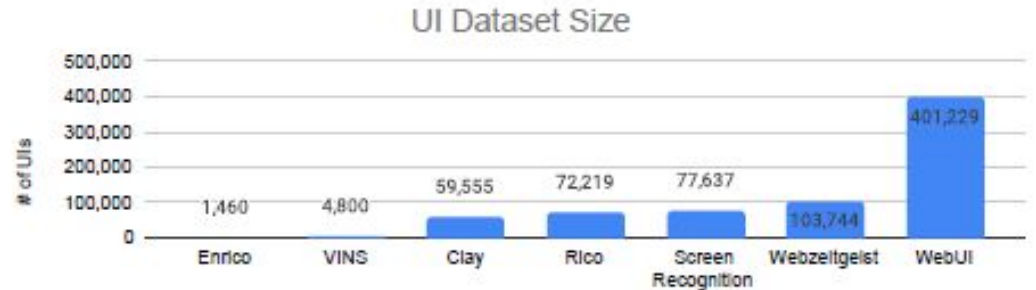
Figure 4: Comparison of WebUI to existing UI datasets. WebUI contains nearly 400,000 web pages and is nearly one order of magnitude larger than existing datasets available for download (Enrico, VINS, Clay, Rico). Each web page also contains multiple screenshots captured using 6 simulated devices.

Results

As per the demonstration aspect of this study, three metrics were implemented; element detection, screen classification, and screen similarity. Element detection had a performance metric called the Mean Average Precision which is a standard metric used for object detection models.

The study found that the element detection models that have been pre-trained with examples from the WebUI dataset outperformed the models without pre-training.

Results

This graph shows the mAP data for the best model configuration for the element detection testing against the baseline model, outlining a 14% improvement in the model performance.
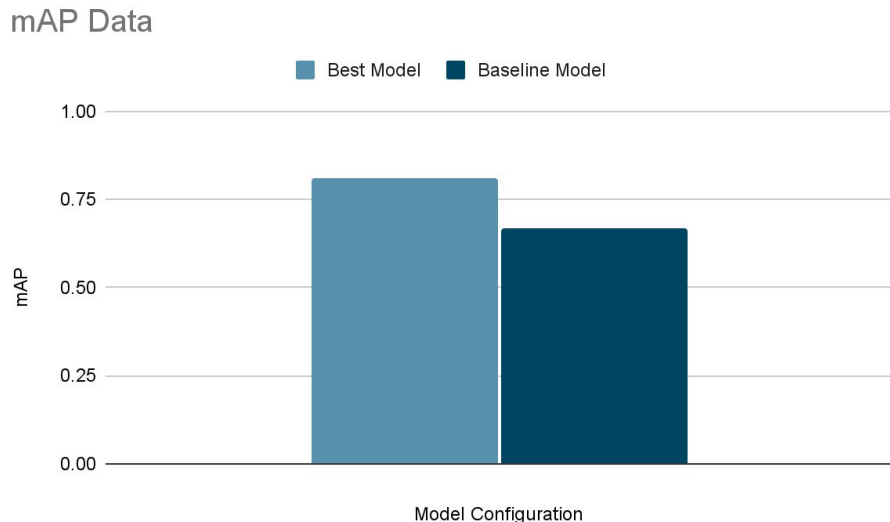
Results

The screen classification tests adopted another way to classify the type or functionality of a screen. A method called self-training, which essentially makes the model teach itself to label data on a web page, was used to classify the screens. The results were that the introduction of self-training (even for smaller datasets for training) produced improved performance in recognizing screen types.

Results

The evaluation of the screen similarity model was done with a quantitative and qualitative measure. The quantitative evaluation was on labelled pairs of web screens and the qualitative evaluation on a set of unlabeled Android interaction videos. Training with more data in the quantitative evaluation made a significant improvement in performance of the model. The qualitative evaluation assessed the model's performance characteristics by utilizing a dataset of screen recordings and sampled frames from the video and evaluated whether a new screen was reached. The model found it was better at detecting some transitions, though it was less effective at others, such as software keyboards and dialogues (which appear less frequently in the WebUI dataset).

Discussion

The element detection model shows how having better element detection can lead to a better user experience by having clearer outlines for bounding elements. *For example, web pages with screen readers can be even more accurate than they are currently without the need for more advanced tools like AI assisting the tasks.

There were limitations to this part of the study, and they came from the fact that the model was unable to attain the same mAP score that was first set for the dataset used, but this was rectified since consistency across the model was kept.

Discussion

Screen classification introduced the self-training method, which caused the baseline model to perform worse than previously reported score results. A student model was trained to investigate the architecture on a new model. The dataset used was smaller than the WebUI dataset (about 18% of the WebUI dataset) so the model's classification skills were poor.

The screen similarity models applied "unsupervised" detection in the unlabeled android videos, but there are detection strategies that can utilize labeled data which could improve the accuracy of the model's performance.

Conclusion

This research *harboured* the development of the WebUI dataset which can be used to support visual UI modelling through its massive 400,000 web page pool. The automatic nature of the web crawler made the dataset efficiently attainable, allowing for more time for application of the data. The three visual UI modelling tasks: element detection, screen classification, and screen similarity yielded many different results that can assist in leading the HCI field to further development.

References

NAME: Kenwyn Simon
STUDENT ID:816037264

Background

Authors:

► Amanda Baughan

Affiliation: Graduatue ofUniversity of Washington School of Computer Science & EngineeringSeattle, Washington, USA

► Mingrui "Ray" Zhang

Affiliation: University of Washington Information School Seattle, Washington, USA

► Raveena Rao

Affiliation: University of Washington Information School Seattle, Washington, USA

► Kai Lukof

Affiliation: University of Washington Human Centered Design & Engineering Seattle, Washington, USA

Background

► Anastasia Schaadhardt

Affiliation: University of Washington Information School Seattle, Washington, USA

► Lisa Butler

Affiliation: University of Bufalo School of Social Work Bufalo, New York, USA

► Alexis Hiniker

Affiliation: University of Washington Information School

Seattle, Washington, USA

Background

► This article was published on 28th April 2022. It was funded by the Facebook and the National Science Foundation but does not reflect the views of the National Science Foundation. Kelsey and Molly's embodied understanding of dissociation and Ningyuan Lee's assistance in resolving issues during the development of the Chirp app are crucial for this study's success.

Abstract

► This research article explores normative dissociation, a cognitive absorption phenomenon characterized by diminished self-awareness and reduced sense of agency, on social media. Participants reported experiencing this dissociation as a break or passively slipping into it. The study found that designed interventions reduced normative dissociation, suggesting normative dissociation may be a more productive framing for discussing social media overuse.

Methodology
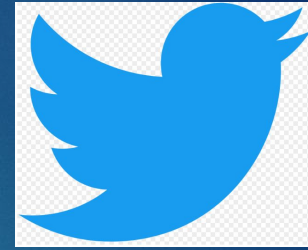
► This research investigates how design decisions affect dissociation during social media use, specifically through a custom Twitter client, Chirp, based on the open-source Twidere app. Four versions of Chirp were created with different internal and external design interventions to measure their effects on users' sense of agency and dissociation. The researchers used the Experience Sampling Method (ESM) to collect real-time feedback from users, while behavioral logging tracked detailed user behavior. Participants were recruited via Mechanical Turk and email lists, and after four weeks, in-depth interviews were conducted with 11 participants who used Chirp for more than three days per week. Data analysis involved quantitative analysis to identify patterns of dissociation, qualitative analysis to focus on recurring themes related to normative dissociation, and grounded theory analysis to develop a conceptual model of normative dissociation.

Results

- The study on dissociative behavior on social media platforms like Chirp reveals that users often experience "losing track of time" or becoming absorbed in their feeds, similar to highway hypnosis. This dissociation involves mindlessly scrolling or engaging with content without paying attention to their actions or surroundings. Users also experience an automatic mode of social media usage, similar to driving without actively thinking about the task. The emotional impact of dissociation varies, with some viewing it as a relaxing break, while others feel shame, frustration, or anger. Normative dissociation often overlaps with compulsive technology use, with features like infinite feeds and notifications exacerbated. Design interventions like custom lists, reading history labels, and time limit dialogs help reduce dissociation by providing clear stop-points or reminders about usage. Mixed reactions to dissociation exist, with some rationalizing their behavior and others feeling regret.

Discussion

- Moreover,the study introduces the concept of normative dissociation to explain user engagement with social media, contrasting it with the "internet addiction" framework. This reframing has significant implications for the Human-Computer Interaction (HCI) field, particularly in understanding user behavior and designing better digital experiences. By recognizing that users enter a cognitive state of deep absorption or mindless scrolling as a natural response, HCI researchers and designers can shift from blaming users for "addiction" to focusing on design interventions that foster healthier relationships with technology. The research can challenge the "addiction narrative" by providing a more nuanced understanding of user engagement and offering opportunities for HCI professionals to reimagine user experience (UX) designs that are less about maximizing time-on-site and more about enabling conscious and satisfying usage patterns.

Conclusion

➤ In conclusion, this research paper introduces the normative dissociation model, which describes users' social media behavior. It suggests that users often experience two main states: deep absorption in content and mindless scrolling. When in a dissociative state, users may struggle to disengage from the platform, highlighting that social media platforms are not neutral spaces. The study suggests that design interventions can disrupt normative dissociation and help users regain self-awareness. It advocates for designs that balance absorption and disengagement, allowing users to exit the experience when they choose. The research challenges the "internet addiction" narrative and emphasizes the importance of designing for positive user experiences. It also highlights the responsibility of social media companies to acknowledge their platforms' design to foster deep absorption. The concept has broad implications for digital wellbeing initiatives.

Conclusion

Entry point	Normative dissociation	Exit point
Passive Spontaneous absorption such as daydreaming and mind-wandering. Often occurs during routinized activities such as driving, showering, etc. **Active** Planned escapes into absorptive experiences, often recreational activities such as films, games, or reading. May be adaptive as a form of stress relief, or maladaptive as a form of avoidance.	**Total absorption** Attention is focused on a very narrow range of experience. This excludes or 'dissociates' context that is ordinarily associated with experience, often resulting in: ● Reduced self-awareness ● Reduced sense of agency ● Reduced sense of time ● Reduced memory of the experience **Flow states** Absorption in personally meaningful activities, such as creative endeavors **Zone states** Absorption in personally meaningless activities, such as gambling	**Ordinary attention restored** People realize their absorption in hindsight, often accompanied by a sense of "I did what?" or "How did I get here?" ● Flow states are positively appraised and affirming ● Zone states are negatively appraised and depleting

➤ Figure:Normative dissociation can be understood as a process. It can begin either as an active choice or passively, through spontaneous absorption. Once totally absorbed, the individual's attention is focused on a very narrow range of experience. It is typically only once ordinary attention is restored that people realize they have dissociated.

Thank You!