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# Immaculacy: A Game of Privacy

**April Suknot**

Department of Computer Science  
University of New Mexico  
Albuquerque, NM 87131  
asuknot@cs.unm.edu

**Nathan Rackley**

Department of Computer Science  
University of New Mexico  
Albuquerque, NM 87131  
nprackley@gmail.com

**Tim Chavez**

Department of Computer Science  
University of New Mexico  
Albuquerque, NM 87131  
tchavez22@unm.edu

**Patrick Gage Kelley**

Department of Computer Science  
University of New Mexico  
Albuquerque, NM 87131  
pgk@unm.edu

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**Abstract**

With the intent of addressing growing concerns regarding online privacy, *Immaculacy* is an interactive story that immerses the player in a slightly dystopian world littered with privacy issues. Events unfold in the narrative based on hidden scores kept during gameplay and calculated based on specific decisions made by the player. Ultimately, we hope to create an engaging environment that helps players consider the decisions they are making in their own lives. We give the player experience with many privacy issues through their explorations of a world of hyper surveillance and connectivity.

**Author Keywords**

privacy; security; interactive story; game design;

**ACM Classification Keywords**

K.4.1. Public Policy Issues

**Introduction**

The continuous evolution in the pervasiveness and connectedness of technology is a subject of growing concern. Databases, smartphones, tablets, laptops, wearables are all united through a single global network—the Internet. This growth has resulted in social networks and other data-collecting applications becoming a major part of everyday life for many

people. Consequently, new threats have emerged which are capable of harming people professionally, financially, personally, and even physically. With medical, educational, financial, and other personal data available online, exploited vulnerabilities have the potential to devastate large numbers of people, with a single attack. Because of this, it is easy to see how privacy and security are among top concerns for many people around the world.

### Game Concept

*Immaculacy* is a game that takes the player to a near-future society, New Washington, with an overbearing city government. The New Washington government keeps constant watch on its citizens through various means of surveillance, in the name of maintaining the "immaculacy." The player will be exposed to many consequences that can arise from this type of governing. There will be instances of citizens being unfairly accused of wrongdoings and sometimes becoming rebellious. Some people will abuse the power or access that they are given. Such abuse, among other vulnerabilities, can result in sensitive information ending up in malicious hands and may also put innocent people in danger. In many cases, the player will find him or herself in the middle of sensitive situations and will be forced to make decisions that may have major consequences in the future.

This interactive story takes the player on a journey, through a world in which personal information is in constant jeopardy. The player is placed in the role of an eighteen-year-old girl, Sydney Carlisle. Sydney is a high-school graduate who grew up in the small town of Danville. Although Sydney and her best friend have



**Figure 1:** With the narrative interface, making decisions is the primary game mechanic and will affect the player's score and elements of the story.

been dreaming of moving to New Washington since grade school, rumors of the oppressive government and technological advancement in the big city cause Sydney to have second thoughts about moving there. When her friend is given a full ride to New Washington University, the pressure builds on Sydney to join her in the peculiar city. Upon arriving in New Washington, Sydney realizes that the watchful eye of the city government is just one of many threats. In order to survive in her new home she must learn how to protect her information and be cautious when trusting others.

Because the intent behind *Immaculacy* is to communicate both the seriousness and the range of attacks that can be used against Internet users, the target audience is very broad. In general, any smartphone owner or person who uses the Internet on a regular basis can benefit from and enjoy this game. We estimate that if submitted to the Entertainment Software Rating Board, the rating given could

**Events unfold in *Immaculacy* based on two types of hidden scores:**

#### **SECURITY SCORES**

**Data Leaking:** Determined by how much sensitive information the player gives when questioned by any NPC.

**City Suspicion:** Determined by how much information the player withholds when questioned by city officials.

#### **PERSONAL SCORES**

##### **Individual NPC Scores:**

Determined by how the player treats the individual NPC, in addition to other NPCs that are somehow related to the individual NPC's story arc.

**Karma Score:** Determined by overall treatment of other characters either directly or indirectly.

##### **These scores affect the main character's:**

- relationships with other characters;
- extent of government surveillance;
- vulnerability to criminals;
- employment and community status.

potentially be up to the Teen rating level due to the psychological nature of the game. The narrative game is presented with a comic book art style, as can be seen in Figure 1. This style offers an experience that can be enjoyable and familiar for people with ranging interests.

#### **Game Design and Mechanics**

Sydney, the character controlled by the player, will have the ability to interact with people, devices, and items in the world through a narrative interface. Certain interactions will present the player with decisions that are tracked and maintained by the game using hidden score metrics.

The primary novel quality associated with *Immaculacy* is the nature of the game within its own genre. Rather than creating a game revolving around quizzing players on their knowledge of privacy issues, this dialogue-based role-playing game is designed to present the player with realistic situations in which Sydney's privacy, and sometimes safety, can be compromised. Furthermore, this game is intended for the average Internet user and is not tailored to a player working within a specific field.

#### **Game Goals**

The online games presented in [1] and [2] educate the average Internet user on several threats that they may encounter on the Internet. The game in [1] is intended to help users identify phishing attacks by studying web addresses, whereas [2] focuses more on general security like virtual and physical handling of sensitive data. Both games however, do present the information similarly, utilizing a quiz-based format where players are asked questions that have a right or wrong answer.

Several other games exist that use a more story or situation based approach to teach a player about security concepts. In contrast to *Immaculacy*, these games are intended to train personnel who are or will be working in an information assurance related field. The games presented in [3] and [4] consist of simulations, which were used to train personnel who are or will be working in a cyber-security, or information assurance related field. Similarly, the game introduced in [5] is a card game and is used in a similar fashion to train people for a privacy related job position. Each of these games presents the player with a variety of scenarios that a professional in the information assurance field may encounter. Depending on the way a player handles a certain encounter; they are met with the appropriate consequence in game. User studies for many of these games have shown some success in training computer users in privacy and security related topics.

We have created a privacy themed mobile game for the average Internet and smartphone user. With this game, our goal is to raise awareness of different types of Internet related threats and the impact they can have on someone's life. Through an interactive story, we have simulated many real situations concerning privacy topics. We hope to give the user some experience with these threats and issues as a result of playing *Immaculacy*.

The studies conducted in [6] and [7] not only reveal concerns that users have with different privacy issues, but they also show where there are still large vulnerabilities for average users. Pilot studies performed for the game described in [1] helped the authors to review the development of the full version of

**Privacy topics that will be encountered in *Immaculacy*:**

**Smartphones**

Smartphone Surveillance  
Smartphone Hacking  
Application Permissions

**Social Networking**

Oversharing Information  
Cyber-stalking  
Cyber-bullying

**E-Mail**

Phishing Attacks  
Viruses

**General Internet Use**

Internet Scams  
Internet Surveillance  
Malware  
Spyware  
Social Engineering  
Adware  
Censorship  
Selling or Leaking Data  
Identity Theft  
Website Privacy Policies

the game to have a larger impact on its players. Similarly, the study conducted in [8] included user testing with privacy policy visualizations to optimize the appearance and layout of the visualization for average users.

We hope to build on the studies in [6] and [7] by addressing some of the issues discussed in these works within the story for *Immaculacy*. We will be conducting upcoming playtests on a demo of the first part of the game. From these tests, we hope to learn more about privacy concerns of Internet users and whether *Immaculacy* is effective in helping players address and consider such concerns. We also plan to use a similar approach to the user studies in [1] and [8] by using the tests that we will be conducting to assist in determining our approach in implementing the full version of the game.

**Conclusion**

With the security threats facing Internet and smartphone users today, *Immaculacy* is a game about Internet privacy that gives players the opportunity to play through events that they could potentially encounter on their connected devices. By assessing various studies and evaluating known threats, we have created a storyline that provides its players with topics and situations to consider when revealing personal information online. While *Immaculacy* is currently in the very early stages of development, we aim to further build on the foundation that we have created. Ultimately, hope to provide an enjoyable, informative, and thought provoking experience. A video of the gameplay demo can be found at: [exit.cs.unm.edu/immaculacy](http://exit.cs.unm.edu/immaculacy).

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