

# **Game with a Purpose: Fake News Project Report**

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## **1 Introduction**

Within the category of ‘fake news’ this project proposes a Game with a Purpose that would attempt to identify fake news statements. The validity of these statements are determined by gathering user responses in the form of an interactive quiz and weighting each answer based on the credibility of where the player searched to find an answer.

This report begins with a brief explanation of the two primary issues of fake news focussed in this project and how they are to be implemented as a Game with a Purpose. Within Overview & System Architecture the report aims to describe the inputs and outputs of this GWAP, how it will be implemented and how each metric is calculated. The following chapter describes the flow of the game from the perspective of the player and how it could be adjusted depending on user feedback. The Evaluation analysis the ways in which this GWAP could be evaluated and its outputs tested. The conclusion reviews the potential of this project and why it should succeed in its purpose.

## **2 The Fake News Problem**

In 2016 an article by Pew Research Center found that 62% of U.S. adults were getting their news from social media.[1] In 2014 The Washington Post published a similar article outlining how few people read past the headlines of articles, which found that only about 40% of Americans read, watched, or heard any in-depth news stories, beyond the headlines, in the last week.[2] These two studies would suggest that many people are consuming news in the form of short statements made online and so are quite literally not getting the full story.

In order to tackle such a monstrous issue as fake news, the Game with a Purpose (GWAP) featured in this report focuses on two of its main problems:

- Classifying news statements as either true or false
- Determining the credibility of a website as a source to check a statement

Classifying the validity of a news statement is difficult to prove without bias. Each statement would need to be impartially cross-examined with trusted sources until a clear solution is apparent. A consistent and unbiased implementation of this problem could quickly identify fake news by its headline, article lede or in the form of tweets without the need to analyse a full body of text.

In order to cross-examine each statement with trusted sources, these trusted sources would need to be identified. Assessing the credibility of websites before featuring them as sources would allow more accurate clarification of fake news statements. Establishing the credibility of websites would provide valuable information on where fake news comes from and where to find the truth.

### **3 Motivations & Target Problem**

Given the subjective nature of a ‘fake news statement’, a program would struggle to classify it as either true or false, even with access to searching the web as a resource. The GWAP outlined in this report is designed to outsource this searching to users, forming a more accurate guess for each statement based on the collective information from its users. For instance, if 70% of users who search the web to investigate a statement mark that statement as false, the GWAP would be inclined to mark it as fake.

But how do we know the users’ searching does not lead them to more false information? The solution proposed by this report is to provide the user with a set of statements we already know the truth values of, shown to the user among statements yet to be determined. Based on the users’ answers to these preset statements, a credibility rating is created for the website they visit before arriving at an answer. This credibility rating allows the program to weigh user responses in accordance with how reliable their source is.

For each news statement examined by this GWAP, the program makes a prediction of its validity based on the user responses to that statement, each weighted by the credibility of its source. In addition to each news statement prediction, the game generates a credibility rating for each website visited. This information would help to identify trustworthy news sources and frequent sources of fake news.

## 4 Overview & System Architecture

Within this GWAP the player is presented with two types of statements:

- Known Statement: Statement the program already knows the answer to
- Unknown Statement: Statement given as input to the GWAP to be classified as true or false

From the player's perspective, there is no difference between these types of statements. Each statement is presented as one question within the true or false quiz.

For each Known Statement answered by the player, the game examines whether they answered correctly and where they searched to before arriving at this answer. Correct and incorrect answers are represented by the integers 1 and -1 respectively. Answers that didn't attempt to search for an answer are ignored. The root domain is saved for each answer that is searched for and the 'correctness' of each answer is saved with the web address it was answered with.

Once a sufficient number of users have played the game, the credibility score of each web site is updated by calculating the average 'correctness' of answers given after visiting that site.

Answers given after visiting Breitbart.com					
	User Answer 1	User Answer 2	User Answer 3	User Answer 4	User Answer 5
Correctness	1	-1	-1	1	-1
Credibility	-0.25				

These credibility scores allow each user's answer to be weighted in accordance with how reliable their source is. The likelihood of a statement being true is calculated using the following formula:

$$P(\text{Statement\_is\_true}) = \sum_{u \in U} \frac{\text{Credibility}(\text{WebSite}(u)) \cdot \text{Answer}(u)}{\text{Size}(U)}$$

True and false answers are represented by the integers 1 and -1 respectively.

U is the set of user responses to that statement. As with calculating credibility, user answers which didn't attempt to search for an answer are not included in this set.

As demonstrated in the mock up of this GWAP, the game would be implemented as an mobile app using the swift programming language and the Xcode framework. The implementation of the game's views would be managed by Xcode's storyboard and the games logic would be configured using Swift.

In order for the GWAP to continue analysing current news statements, an additional piece of software would be required to find new statements. Each statement must not contain subjective language such as 'my' or 'I' and should relate to general knowledge i.e. An article headline entitled 'Finding your Summer look' from a beauty website should not be selected.

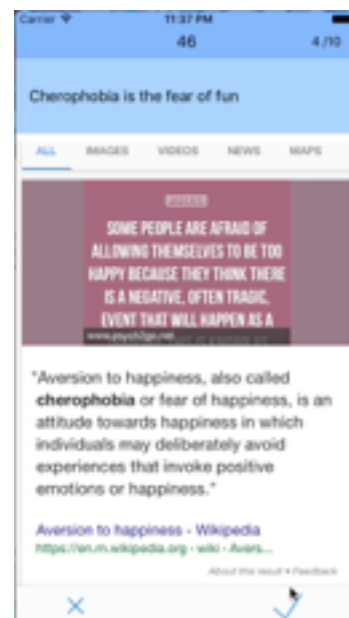
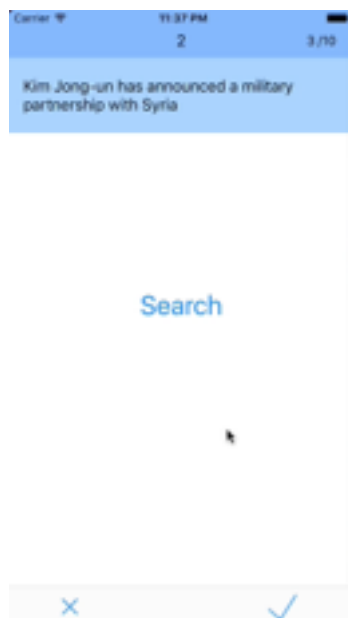
## 5 Game Design & Mechanics

Fact Check is a quiz game with a twist. Unlike the average quiz, Fact Check encourages the player to cheat. For each run of the game, the player is presented with a series of true or false statements. For each statement the user has 5 seconds to select an answer, or if they are unsure... they can cheat!

In the centre of the game display is a search button. When pressed, this button expands into an embedded search browser which gives the user a full minute to search for an answer. Maximum points are awarded for a correct answer without searching, however the player will earn more points for an incorrect answer if they try to search for an answer first.

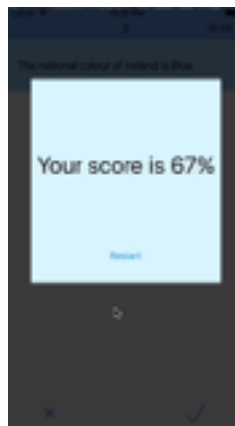
Allocating points in this way incentivises the player to investigate statements that may be false, feeding into the fake news classifier of this project.

Points awarded for each true or false statement		
	Searching	No Searching
Correct	7 Points	10 Points
Incorrect	3 Points	0 Points

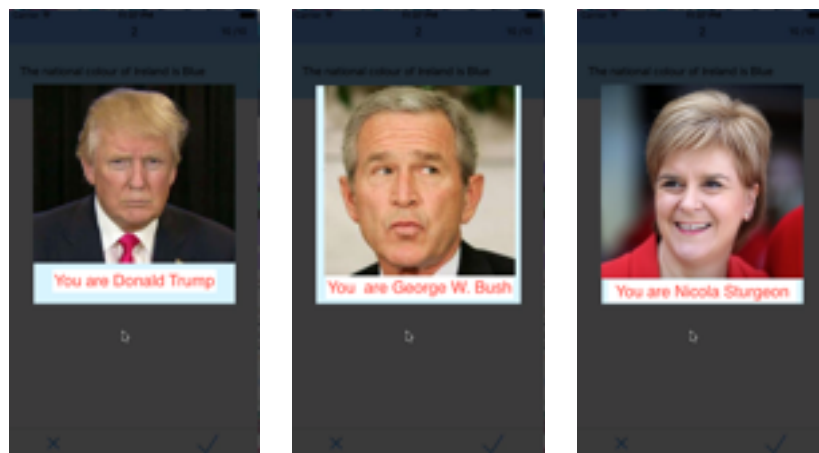


The game features a timer at the top of the view. This timer helps to make the game feel more competitive and prevents the player from looking up the answer outside of the app. The time allowed per question and the bonus time allocated for searching an answer may be adjusted in the future, depending on user feedback.

Once the user reaches the end of the game they are given an accuracy score representing how well they did. This score is calculated as a percentage of the total points available in the quiz.



As an alternative to this plain, numerical result, a more fun result might be if the game gave the player a politician, depending on the range of the player's score. Below are three examples of how politicians could be used to give a more entertaining result:



The 'Known Statements', as mentioned earlier in the report, are offered to the user based on a wide range of topics. These statements could be changed to become purely political or news-related statements as to fit in better with the content of the 'Unknown Statements'. If this idea were to be included along with the 'which politician are you?' idea, the app could become a News Quiz aimed at judging your knowledge of topical matters.



## **6 Evaluation**

The evaluation of this GWAP could be done by adding multiple ‘Known Statements’ as ‘Unknown Statements’ and comparing the results for each with their correct answer. Using this test case evaluation method would reveal if each statement is being correctly classified, by what error they are off by and could be taken as an indicator of how reliable the credibility ratings are.

The credibility ratings would prove difficult to evaluate directly, as they rely solely on the users’ ability to identify fake news statements. However, this ability to identify fake news to be measured independently of credibility ratings by calculating the percentage of correct answers for each user. This information in turn, could be used to further weigh each user’s responses to Unknown Statements in the algorithm for predicting the validity of statements. If a user has a tendency to search for answers and arrive at the wrong answer anyway, their response could be valued lower than other responses with this adjustment.

## 7 Conclusions

When designing a game with an atypical purpose such as identifying fake news, an underestimated challenge is making the game fun. You could design a quiz to help fight world hunger by donating 10 grains of rice for each correct answer,[3] but if you don't make it fun to use the affect is severely limited.

I believe this Fact Check design of a Game with a Purpose has the potential to correctly classify fake news statements. I believe if implemented and supplied with enough user input it would create a database of news sources and their credibility, ranging from reliable to misleading. The one element I cannot predict the outcome of is how fun the game would be to play.

However, if I were to pursue with this game further I would add fun animations using Swift's UIKit graphics; changing the timer from a number to an rotating arc and allowing the user to swipe the view like a tinder card instead of tapping the true or false buttons. The content of the quiz could be separated into categories and levels with fake news statements assorted into their relevant quiz.

As a fail suggestion for how to make the game more fun I would recommend emphasising the search button as a cheat button. Perhaps no one has considered cheating as an effective way of cutting through misinformation!

## Bibliography

- [1] Gottfried, Jeffrey & Shearer, Elisa. 26th May 2016. 'News Use Across Social Media Platforms 2016' Pew Research Center. <http://www.journalism.org/2016/05/26/news-use-across-social-media-platforms-2016/>
- [2] Cillizza, Chris. 19th March 2014. 'Americans read headlines. And not much else.' The Washington Post. [https://www.washingtonpost.com/news/the-fix/wp/2014/03/19/americans-read-headlines-and-not-much-else/?utm\\_term=.12fe6717b06d](https://www.washingtonpost.com/news/the-fix/wp/2014/03/19/americans-read-headlines-and-not-much-else/?utm_term=.12fe6717b06d)
- [3] Free Rice. <http://freerice.com/#/english-vocabulary/1427>