

Social Media Walking Prediction Model

User Guide

Version 1.0

4th May 2014

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Introduction

This site was developed for my final year developmental project at Cardiff Metropolitan University. The website is intended to display the potential of a web-based walking prediction model using social media geo-location data.

The details of this website can be seen in “*The Development of a Walking Prediction Model using Social Media data, in the Field of Crime Analysis*”.

This user guide will give you a breakdown of the features on each page of the website. The details of how to use each feature (as well as what each feature does) will be displayed to you using screenshots and text.

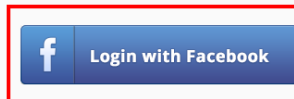
Login process

Social Media Walking Prediction Model

Social Media - It's everywhere. You have it, your parents have it, maybe even your grandparents have it. The purpose of this website is to demonstrate the potential your social media locations have.

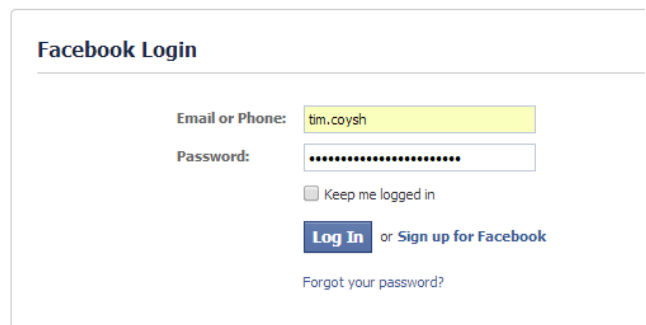
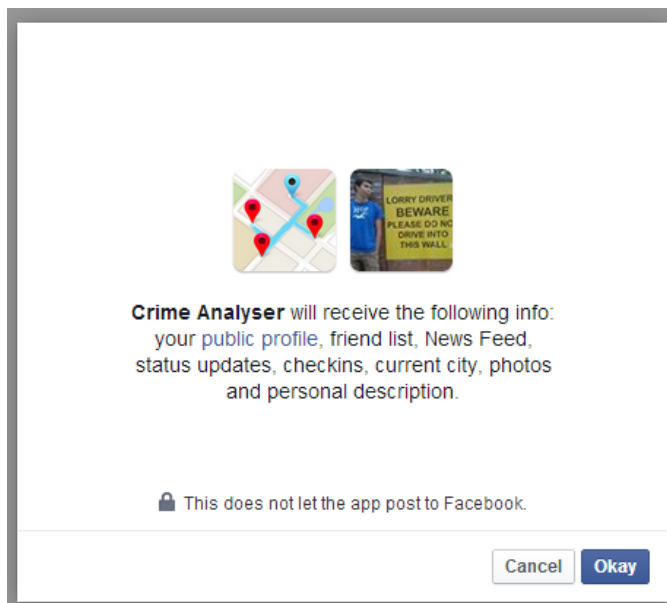
In this example, we will use Facebook as a social media data source and predict your next location based on selected locations you have chosen.

To start, please login with Facebook



To login to the website go to the home page and click on the 'Login with Facebook' button.

You will then be directed to the Facebook website, which will ask for your Facebook login details.

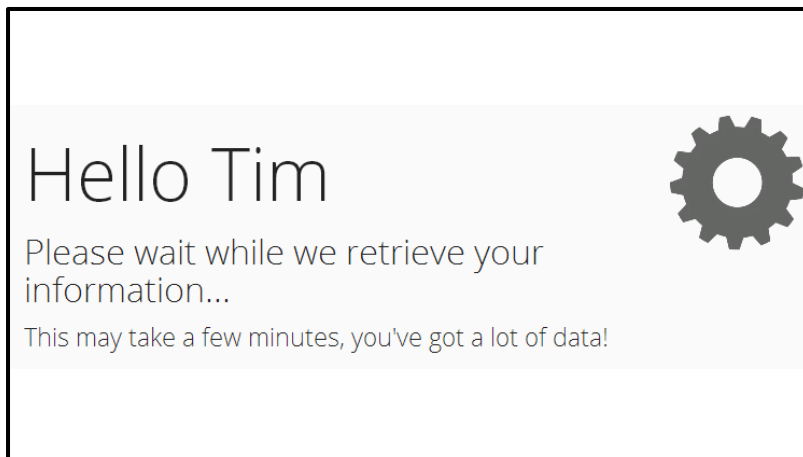
A screenshot of the Facebook login page. It has a white background with a thin grey border. At the top, it says 'Facebook Login'. Below that, there are two input fields: 'Email or Phone:' with the text 'tim.coysh' and 'Password:' with a masked password '*****'. There is a checkbox for 'Keep me logged in'. Below the inputs are two buttons: a blue 'Log In' button and a link 'or Sign up for Facebook'. At the bottom, there is a link 'Forgot your password?'.

Facebook will then ask you to give the 'Crime Analyser' application the appropriate permissions. The application will only access your information, such as public profile information, check-ins and status updates. **It will not post on your behalf.** You can accept these permissions by pressing the 'Okay' button.

Congratulations! You will be now be logged in to the website via Facebook. The website will then direct you to the data retrieval pages.

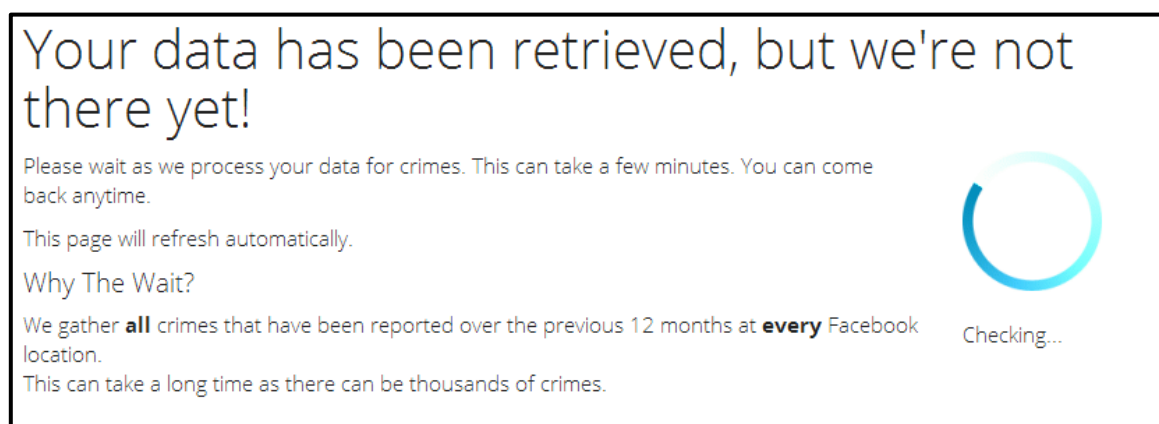
Data retrieval

The data retrieval process retrieves all of the geo-location data from your Facebook profile, as well as cleaning the data and analysing each location for crimes committed within that area.



The first page will inform you that you have logged in. This page will download all your data from Facebook and reload automatically when retrieved.

The page may take a few minutes to download all of your data – depending on how many locations you are tagged in on Facebook.



After your data has been retrieved from Facebook the locations will be individually processed by the system. The system will analyse each location to determine the number of crimes that happened within that location within the previous month.

This page will automatically redirect to the results page when the system has finished processing all of the Facebook locations.

Results page

The results page displays all of the information that has been processed by the system, as well as giving you options to use the walking prediction model.

Walking Prediction Model

Predict Your Next Location

Select four or more locations that you're likely to go to on your next journey.

Select area (in km) of predicted location you want to analyse for crimes

2.50 km

- ☐ Starbucks (Cardiff Met SU) (You were last here in April 2014)
- ☐ Nando's Cardiff Brewery Quarter (You were last here in April 2014)
- ☐ Computer Science Department, Cardiff University (You were last here in February 2014)
- ☐ Hebron Hall, Dinas Powys (You were last here in February 2014)
- ☐ St Andrew's Church, Chorleywood (You were last here in February 2014)
- ☐ The Live Lounge (You were last here in January 2014)
- ☐ St John the Baptist Church, Cardiff (You were last here in January 2014)
- ☐ The Mackintosh (You were last here in January 2014)
- ☐ Cardiff University's Student Union (You were last here in January 2014)
- ☐ Woodchester (You were last here in January 2014)

Predict Location

To use the walking prediction model, you must select four or more locations that you're likely to go on your next journey.

The page displays a list of all the locations that the system retrieved from your Facebook profile.

You can select each location individually using the checkbox to the left of the location.

You can also select the radius – which is the radius of the predicted area you want to find previous crimes.

Once you've chosen your locations and area, press the 'Predict Location' button to go to the prediction results page.

Crime Information

The results page also details the information processed about the crimes that have occurred near the locations you have been tagged in on Facebook, during the month you were there.

Statistics

Some statistics about your data

The average crimes committed in a month near your Facebook locations: **946**

You are at a **High Risk** of crimes compared to the national user average

The location with the most crimes committed is **Leicester Square** with an average crime count of **4,755** per month

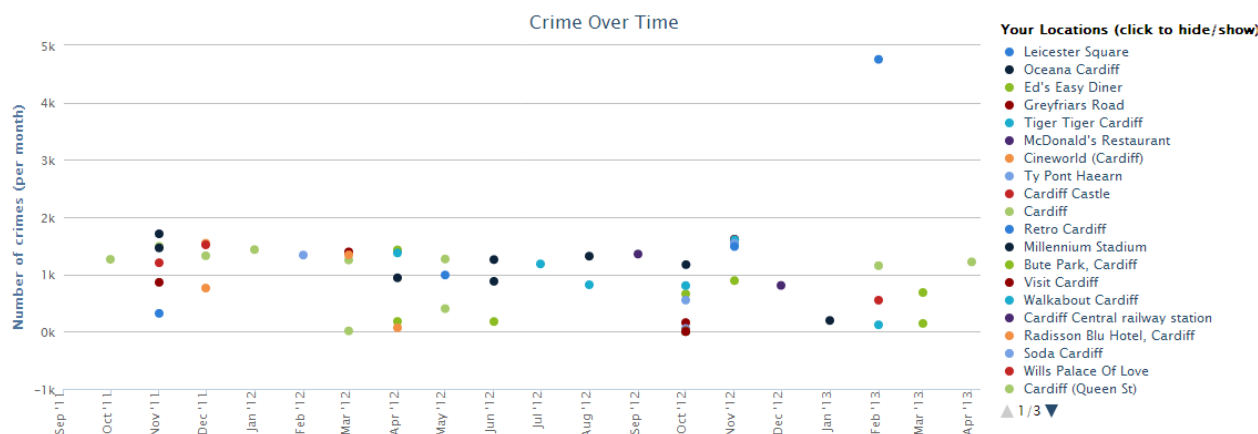
The location with the least crimes committed is **Sugar Loaf** with an average crime count of **0** per month

The most crimes committed in a month was in **October 2012** with a total of **8,750** crimes

The statistics section displays interesting statistics about the locations you have been too, such as the locations with the highest and lowest crime rates.

Crime Graphs

Personalised graphs that show your locations and crime over time



The crime graph displays each of your locations on a graph. Time is displayed on the x-axis, whereas the number of crimes that have been committed in the location is on the y-axis.

The locations on the graph each have an individual colour, which corresponds to the key aligned to the right of the graph.

The graph is interactive, so moving your cursor over each of the locations will detail what the location is, the date and number of crimes (that happened within a 1km area during the month).



Table

Your crimes in a table

Search for <input type="text"/>		
Date	Location	Number of Crimes
January, 2013	Leicester Square	4755
October, 2011	Oceana Cardiff	1708
October, 2011	Ed's Easy Diner	1621
October, 2012	Greyfriars Road	1615
October, 2012	Oceana Cardiff	1608

The crime table simply lists all of your Facebook locations in a table – detailing the month you were there, the location name and the number of crimes that happened within a 1km area of that location during the month.

The table is sorted in descending order of number of crimes.

The table is searchable, so typing a location name into the search bar will filter the locations according to the location name.

Glouces <input type="text"/>		
Date	Location	Number of Crimes
Searching for: "Glouces"		
July, 2012	Gloucester Cathedral	819
September, 2012	Gloucester Cathedral	804
March, 2012	Stroud, Gloucestershire	178
May, 2012	Stroud, Gloucestershire	176

Prediction test page

The prediction test page gives you the chance to test the walking prediction model using your own customisable locations.

Test The Walk Prediction Model

The Walking Prediction Model created for this website has a large range of potential uses, not only in the field of social media. This tool helps you to test the model by allowing you to **input any number of locations in order** and submit them to the model.

Enter a different location on every line

Cardiff Metropolitan University
Cardiff Castle
Millennium Stadium
Cardiff Central

Select Search Radius for Crimes



2.50 km

Select Date for Crimes

March, 2014 ▼

Predict Location

Click these examples routes to test them

[Cardiff Student Walk](#)
[Cardiff Pub Walk](#)
[Gloucestershire Tourist Route](#)
[United Kingdom Tourist Walk](#)
[Straight Line Walk](#)

The page offers three customisable features: a text area, scroll bar and drop down box. You can input locations into the text area, with one location per line. For the crime analysis you can select the radius of the area you want to search for crimes using the scroll bar. You can also select the month to search for dates using the drop down box.

Any form of location can be input into the text area including:

- Postcodes
- Addresses
- Latitudes and Longitudes
- Place names
- Landmark names

You can click the examples to the right of the test feature to automatically input some example journeys. These journeys will then be predicted using the model.

Click these examples routes to test them

[Cardiff Student Walk](#)
[Cardiff Pub Walk](#)
[Gloucestershire Tourist Route](#)
[United Kingdom Tourist Walk](#)
[Straight Line Walk](#)

Prediction results page

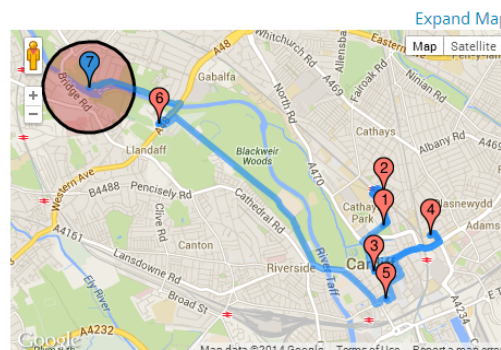
After you have selected locations to predict, either from the results page or the prediction test page – you will be directed to the prediction results page. This page utilises the walking prediction model in order to predict your next most probable location.

Your Predicted Location

We have predicted your next location is **Gabalfa Road**
This is based on the 6 locations you chose

Low Risk

You are at a low risk of crime if you continue on your predicted walk



The top area of the page will display (in bold) the name of the predicted location the model has predicted you might go to next. It will also state whether the location is at a high risk or low risk of crime.

The top area also displays a dynamic map of your selected locations, as well as your predicted location. The blue line indicates the quickest route between each location, if you were walking.

The map can be dynamically expanded by clicking the 'Expand Map' button.

Previous Crimes

There were **21** crimes within 0.5km of this location last month

Types of Crime

You are at risk from
Anti Social Behaviour

There were **5** Anti Social Behaviour crimes at this location last month.

There were also other crimes:

Type of Crime	Number of Crimes
Anti Social Behaviour	5
Criminal Damage Arson	4
Burglary	3

Outcomes of Crime

The most frequent outcome is:
Under investigation

9 crimes are classified with **Under investigation**

There were also other outcomes:

Outcome	Number of Instances
Under investigation	9
No outcome yet	5
No further action at this time	4

Forces Involved

A majority of crimes were dealt with by
The Police

21 crimes were dealt with by **The Police**

The page also displays the previous crimes that happened within the area you selected of the location in the previous month. This section details the number of crimes, along with the type of crimes, outcomes of crimes and the forces involved.

Search results page

The search results page displays crimes that have happened within the searched location during a specific month.

Search Location

Submit

Select area (in km) of predicted location you want to analyse for crimes

0.50 km

Select Month

March, 2014
February, 2014
January, 2014
December, 2013
November, 2013
October, 2013
September, 2013

Crimes at Cardiff Metropolitan University, Llandaff

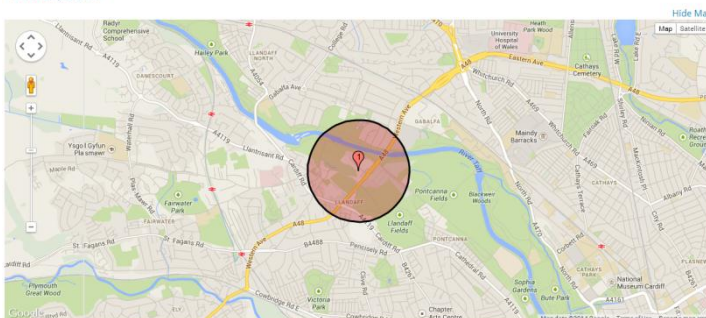
Low Risk

There were **24** crimes within a **0.5km** radius of Cardiff Metropolitan University, Llandaff during **March, 2014**

The top area of the page displays the search box, which allows you to search a location (using postcode, address, place name, latitude/longitude etc.). It also provides a slider that allows you to choose a crime search radius.

After you have searched the location, you can select the month to search for crimes on the right. The page also details how many crimes happened within the area during the month selected.

There were **24** crimes within a **0.5km** radius of Cardiff Metropolitan University, Llandaff during **March, 2014**



You can then see the searches location on a map, with the selected radius around the marker.

Types of Crime

You are at risk from **Vehicle Crime**

There were **9** Vehicle Crime crimes at this location last month.

There were also other crimes:

Type of Crime	Number of Crimes
Vehicle Crime	9
Criminal Damage Arson	4

Outcomes of Crime

The most frequent outcome is: **No further action at this time**

15 crimes are classified with **No further action at this time**

There were also other outcomes:

Outcome	Number of Instances
No further action at this time	15
Under investigation	6

Forces Involved

A majority of crimes were dealt with by **The Police**

24 crimes were dealt with by **The Police**

The page also details the crimes that happened within you searched location during the selected month. It details the types of crimes, outcomes of crimes and police forces involved.