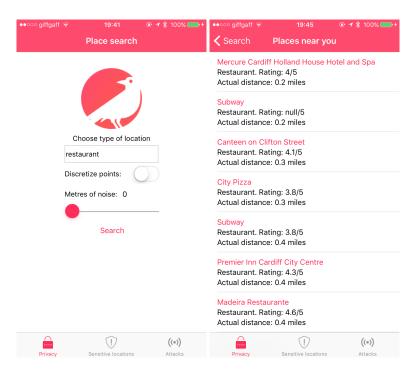
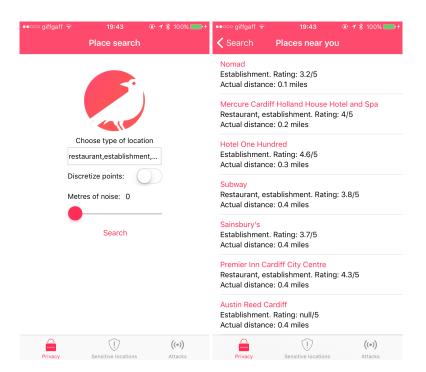
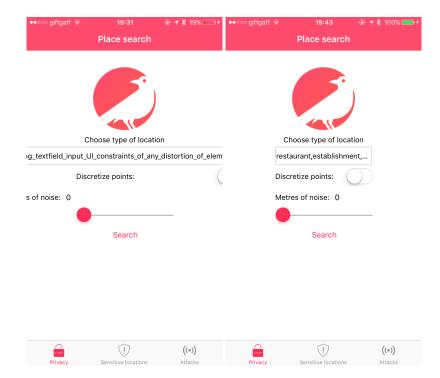
Appendix A



Test 1: Entering a single place type successfully results in a valid response.



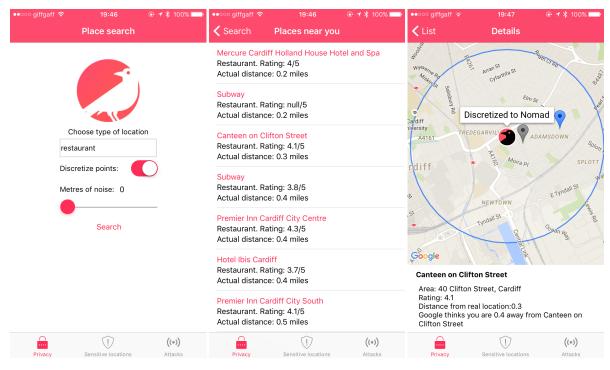
Test 2: Entering multiple place type successfully results in a valid response. Google's API does not always return results for multiple place types, this is an issue with the API, tested also through a browser request (see Appendix-B).



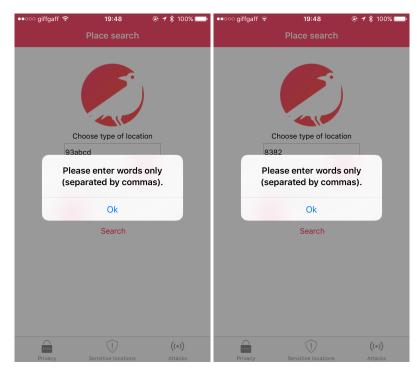
Test 3: The textfield stretched and caused distortion (left). This was rectified with UI constraints to ensure no stretching took place (right).

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	Mercure Cardiff Holland House Hotel and Spa Restaurant. Rating: 4/5 Actual distance: 0.2 miles Subway Restaurant. Rating: null/5 Actual distance: 0.2 miles	AVS PARK				
Choose type of location restaurant	Canteen on Clifton Street Restaurant. Rating: 4.1/5 Actual distance: 0.3 miles	adamsdown pictures				
Discretize points:	City Pizza Restaurant. Rating: 3.8/5 Actual distance: 0.3 miles					
Search	Subway Restaurant. Rating: 3.8/5 Actual distance: 0.4 miles					
	Premier Inn Cardiff City Centre Restaurant. Rating: 4.3/5 Actual distance: 0.4 miles	Google Canteen on Clifton Street Area: 40 Clifton Street, Cardiff				
	Madeira Restaurante Restaurant. Rating: 4.6/5 Actual distance: 0.4 miles	Artea. 40 Clinton Street, Caldin Rating: 4.1 Distance from real location:0.3 Google thinks you are 0.4 away from Canteen on Clifton Street				
Privacy Sensitive locations Attacks	Privacy Sensitive locations Attacks	Privacy Sensitive locations Attacks				

Test 4: Only additive gaussian noise is added, resulting in a successful retrieval of data.



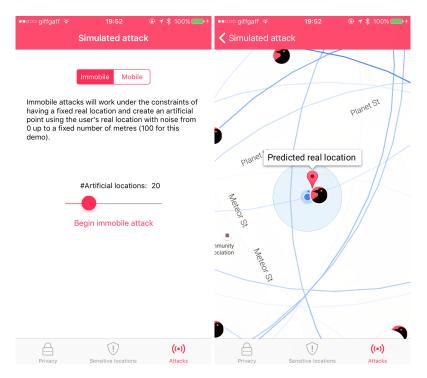
Test 5: Only discretize points is selected, resulting in a successful retrieval of data.



Test 6: A mixture of integers and letters are entered into the text field (left) as well as integers only (right). Validation warnings are presented.

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The Parade. Cardiff. Car	diff CF14 2EE	. UK			
Enter metres of nois	distance se to have from t en 100-1000m.	UK			
Save	Cancel				
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asdfg	g h j	k I			
	/ b n	m			
123 😅 spa	ace	return	Privacy	Sensitive locations	((•)) Attacks

Test 7: A sensitive location is added with the correct input given, in integers, and this is added into the manage sensitive locations panel (right).



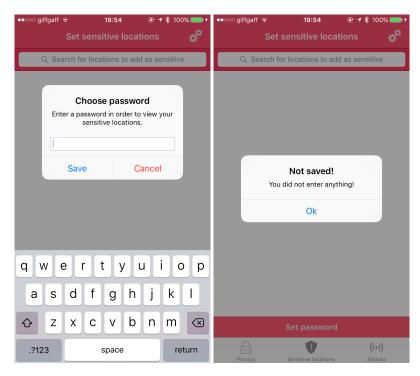
Test 8: An attack is conducted with an arbitrary number of artificial locations generated from a fixed location, which can be used to reverse-engineer a user's real location.

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The Parade. Cardiff.	. Cardiff CF14 2	EE. UK	The Parade, Cardi	ff, Cardiff CF	14 2EE, UK
Enter metres c	ose distance of noise to have fro etween 100-1000		The Parade, Cardi	ff, Cardiff, Ca	ardiff CF24, UK
incorrectInput					
Save	Cano	el		Error	
			En	ter integers onl	y!
				Ok	
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Test 9: String input is entered instead of integers, when specifying, a warning is given to the user specifying to input integers only.

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The	e Para	ade. (Cardif	ff. Cai	diff (CF14 :	2EE. I	JK		The Parade. Cardiff. Cardiff CF14 2EE. UK				The Parade, Cardiff, Cardiff CF14 2EE, UK			ІК						
The	The F Choose distance UK Enter metres of noise to have from this location. Between 100-1000m. 1001					K	The F Choose distance UK Enter metres of noise to have from this location. Between 100-1000m.				The Parade, Cardif	, Cardiff, C	ardiff CF2	4, UK									
		S	ave			Can	cel					5	Save			Can	cel			Please enter	Error values 100-1 only.	000 metres	
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Test 10: When saving a sensitive location, if supplying noise levels outside 100-1000 metres, an error is given to the user.



Test 11: When setting a password for the sensitive locations management panel, if a blank password is supplied, a warning is given.

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	ter a password i	password in order to view locations.	your			
	Save	Cance	I	Y	Saved our sensitive data is par protected.	ssword
					Ok	
qw	e r t	y u	i o p			
a s	d f	g h j	k I			
ۍ z	xc	v b n	m		Change passwor	d
123	sp	ace	return	Privacy	Sensitive locations	((•)) Attacks

Test 12: If the user supplies input when setting a password, a pop-up notifies them that their sensitive location data will be password protected.

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Set sensitive locations	Set sensitive locations 🛛 💣
Q Search for locations to add as sensitive	Q. Search for locations to add as sensitive
Password change Enter your current password and your desired new password. I'ype current password here. ••••• Save Cancel	Not saved Enter your current password! Ok
qwertyuiop	
asdfghjkl	
☆ z x c v b n m ⊗	Change password
.?123 space return	Privacy Sensitive locations Attacks

Test 13: When changing the set password, when supplying a new password however no current password, a warning is given to the user to enter their current password.

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	Save	C	ancel			E	Not saved	ord!	
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123	5	space		return		···· vacy	U Sensitive locations		((•)) .ttacks

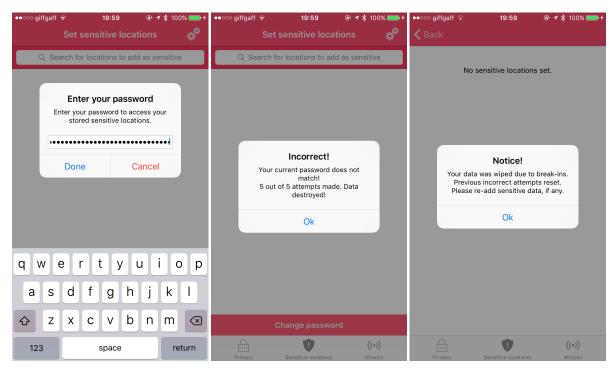
Test 14: When changing the set password, when supplying the current password however no new password, a warning is given to the user to enter their desired new password.

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•••	••••	and your		Incorrect! rent password doe match! 5 attempts made. destroyed! Ok		Your dat Previo	Notice! a was wiped due to us incorrect attemp re-add sensitive da Ok	break-ins. ts reset.
q w e	ertyu	iop						
a s	d f g h	j k l						
δZ	x c v b	n m 🗵	Ch	ange password				
123	space	return	Privacy	Sensitive locations	((●)) Attacks	Privacy	Sensitive locations	((•)) Attacks

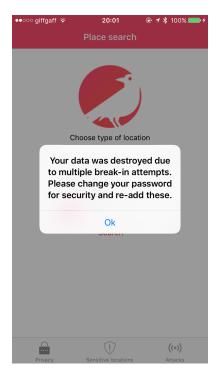
Test 15: When changing the set password, if supplied the incorrect current password, attempts up to five are counted, and when reached, sensitive location data is destroyed.

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Er	nter your passw stored sensi	r password ord to access y tive locations. Cance				
q w e	ert	y u	i o p			
a s	d f	g h j	k I			
순 Z	xc	vbn	m			
123	sp	ace	return	Rrivaov		((•))

Test 16: If accessing the saved sensitive locations panel, when the correct password is supplied, the user is granted access successfully.



Test 17: If directly attempting to break into the sensitive locations panel by entering incorrect passwords, attempts up to five are counted, and when reached, the sensitive location are destroyed.



Test 18: When data has been destroyed and failure attempts have not been reset through a successful login, each time the user uses the privacy tab, they are alerted that sensitive locations were deleted.

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Q Search for locations to add as sensitive Enter your password to access your stored sensitive locations. Done Cancel	Incc Your current p m 2 out of 5 a	ons to add as sensitive		ensitive locations set. Notice! nincorrect attempts reset.
q w e r t y u i o a s d f g h j k ☆ z x c v b n m 123 space retu	urn	password ((•)) relocations Attacks	Privacy	((*)) Sensitive locations Attacks

Test 19: If incorrect password is entered to access the manage panel, failure attempts are counted. If access succeeds with the correct password, previous failure attempts are reset, whilst attempts have not reached the maximum limit.

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	nter your cu	irrent pa	change issword an bassword.	-		ľ	Your curre	ncorrect! nt password d match! f 5 attempts m Ok					Notice!		
qw	e r	t	y u	i	o p										
a s	d f	g	h j	i k											
순 Z	x	v	br	n n			Chai	nge passwoi	rd						
123		spac	e		return	<u>.</u>		V		((∘))			V		((•))

Test 20: If changing password and entering an incorrect current password, failure attempts are counted. If the manage panel is accessed with the correct current password, before the attempts limit is reached, any previous failure attempts are reset.