EPSRC Digital Economy

Jane Binner\textsuperscript{1}, Baseerit Nasa\textsuperscript{1}, Maria Angela Ferrario\textsuperscript{2}, Will Simm\textsuperscript{2}, Jon Whittle\textsuperscript{2}

Sheffield University\textsuperscript{1}
Lancaster University\textsuperscript{2}
No police patrols – dangerous to go out at night

Made four calls to the police before they finally showed up
Data Understanding
Create a conversation
speech recognition

natural language processing
theme, sentiment, actionability

instant feedback
VYV trials @ Lancaster Library

6 Week Installation

2000 comments from 600 people*

Comments processed live with speech to text and NLP

Live summaries (Themes+Sentiment) presented in location

*Photo by Nigel Slater, Lancaster Guardian
Include everyone
“Very helpful and friendly staff”

<w pos="NN" svo="" lemma="staff" sem="I3.1/S2">staff</w>

- Noun picked from POS = “Staff” sem tag I3.1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I2.2</td>
<td>Business: Selling</td>
</tr>
<tr>
<td>I3</td>
<td>Work and employment</td>
</tr>
<tr>
<td><strong>I3.1</strong></td>
<td>Work and employment: Generally</td>
</tr>
<tr>
<td>I3.2</td>
<td>Work and employment: Professionalism</td>
</tr>
<tr>
<td>I4</td>
<td>Industry</td>
</tr>
</tbody>
</table>

- Secondary sem tag S2

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<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>S1.2.5</strong></td>
<td>Toughness; strong/weak</td>
</tr>
<tr>
<td><strong>S1.2.6</strong></td>
<td>Sensible</td>
</tr>
<tr>
<td><strong>S2</strong></td>
<td>People</td>
</tr>
<tr>
<td>S2.1</td>
<td>People:- Female</td>
</tr>
<tr>
<td>S2.2</td>
<td>People:- Male</td>
</tr>
<tr>
<td>S3</td>
<td>Relationship</td>
</tr>
</tbody>
</table>

*USAS Semantic Tagset - [http://ucrel.lancs.ac.uk/usas/](http://ucrel.lancs.ac.uk/usas/)*
Sentiment Analysis

• Comment tagged as positive, due to presence of positives “helpful”, “friendly” and positive modifier “very”

<w pos="RG" svo="" lemma="very" sem="A13.3"> Very</w>
<w pos="JJ" svo="" lemma="helpful" sem="S8+">helpful</w>
<w pos="CC" svo="" lemma="and" sem="Z5">and</w>
<w pos="JJ" svo="" lemma="friendly" sem="S1.2.1+">friendly</w>
<w pos="NN" svo="" lemma="staff" sem="I3.1/S2">staff</w>
Major challenge in context awareness is the **length of comment**. There is very little information available to identify the context from the comments.
I think the library is much lighter and fresher and brighter and easier to to see.

I think it’s a shame that there is less stoc...
Some research findings
traditional methods versus VYV

→

no significant difference in quality of data; but VYV is anytime, anywhere
Accuracy of auto-tagging: theme

→

70-78% acceptable
Accuracy of auto-tagging: actionability

→

76% accurate
Accuracy of auto-tagging: sentiment → 55% accurate
Eliciting positive responses

→

VYV results in higher proportions of positive comments
Benefits of VYV

→

Anytime, anywhere;
Automatic;
Two-way conversation
Open questions

What motivates people to get involved;
How to encourage participation?
YOU ARE NOW ENTERING FREE DERRY
CHAIRPERSON’S FOREWORD

Dear Householder,
I would be grateful if you would take a few minutes of your time to complete the attached questionnaire on satisfaction and confidence with the service currently provided by the PSNI.

The District Policing Partnership has secured the inclusion of a satisfaction and confidence baseline in this year’s Local Policing Plan. I would encourage you to complete the survey and return to the DPP. This is a unique opportunity for you to have your say on local policing and inform both the PSNI and the DPP what type of police service is being provided in your area.

The Derry DPP will continue to challenge the police on issues raised by you thereby ensuring that your concerns are addressed.

The results of the survey will form the basis of the Local Policing Plan for Foyle for 2010 – 2011 and will inform the Area Commander where resources need to be allocated.

Thank you for taking the time to complete the questionnaire ensuring that local people shape local policing.

Please return the completed questionnaire (no stamp required) to the Freepost address by 31st August 2009. Anyone interested in being entered into the free prize draw should provide contact details in the space below (telephone no./e-mail address) please do not provide your name or postal address.

Cllr Elisha McLaughlin
Chairperson, Derry District Policing Partnership

Satisfaction & Confidence Survey

1. Which of the following groups do you belong to?
   Gender: □ Male, □ Female
   □ Age Group: Under 16, □ 16-24, □ 25-40, □ 41-60, □ 61 or over
   □ Religion: □ Protestant, □ Catholic, □ Other (please specify) □, □ None

2. Which police neighbourhood do you live in?
   □ Waterside Rural - Rural Areas of the Waterside
   □ Waterside Urban - Urban Areas of the Waterside
   □ City Centre - Bogside, Brandywell, Fountain, City Centre, University and Pennyburn
   □ City West - Creggan, Beechwood, Crevagh, Rosemount, Foyle Springs, Ballymaga roaty, Coshquin, Hazelbank and Springtown
   □ City North - Galliagh, Culmore, Shantallow and Steelstown

3. How much confidence do you have in the police’s ability to provide an ordinary day to day policing service for all the people of the Foyle area?
   □ Total confidence
   □ A lot of confidence
   □ Some confidence
   □ Little confidence
   □ No confidence at all
   □ Don’t know
   Reason for answer:

4. Do you think the PSNI are doing a good job in the Foyle Area?
   □ Yes
   □ No
   □ Don’t know
   Reason for answer:
Challenge: How do people feel...

- **36% of respondents** answered ‘don’t know’ to the satisfaction question => How can the police ‘win’ the undecided?

- Understanding ‘Why’ people are undecided may help...

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** SATISFACTION (Derry City Council Area) **

- Yes: 35%
- No: 27%
- Don’t Know: 36%
- No Answer: 2%

** diagram and figures from DDPP survey **
Do you think the PSNI are doing a good job in the Foyle area?

Don’t know – PSNI take too long to respond to a reported incident.

Don’t Know - They certainly don’t appear to be able to curb the problems in my area of Culmore.

Don’t Know - Because they let the young joy riders straight out again also they know all the drug dealers in the one area still they turn a blind eye.
**THEMES BY LOCATION**

Match Themes to Neighbourhoods

Neighbourhood analysis of Satisfaction with Policing in Derry

<table>
<thead>
<tr>
<th>Themes (aggregated)</th>
<th>Foyle City Centre</th>
<th>City North</th>
<th>Foyle City West</th>
<th>Waterside Rural</th>
<th>Waterside Urban</th>
<th>Total by Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Impression</td>
<td>8</td>
<td>17</td>
<td>8</td>
<td>17</td>
<td>11</td>
<td>61</td>
</tr>
<tr>
<td>Presence and Visibility</td>
<td>2</td>
<td>13</td>
<td>9</td>
<td>16</td>
<td>8</td>
<td>48</td>
</tr>
<tr>
<td>Police Behaviour/political policing</td>
<td>4</td>
<td>13</td>
<td>7</td>
<td>13</td>
<td>9</td>
<td>46</td>
</tr>
<tr>
<td>Offences and Crime Level</td>
<td>3</td>
<td>14</td>
<td>8</td>
<td>11</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Response Time and Quality</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>11</td>
<td>12</td>
<td>32</td>
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<tr>
<td>Other</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Resources Incl. Admin</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>People Behaviour</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Community Policing</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Specific Events/Location</td>
<td>-</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Complexity of Situation</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>4</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Authority/Law Enforcement</td>
<td>-</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Perceived Safety</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><strong>Neighbourhood</strong></td>
<td><strong>Freq.</strong></td>
<td></td>
<td><strong>Freq.</strong></td>
<td><strong>Freq.</strong></td>
<td><strong>Freq.</strong></td>
<td><strong>Total by Themes</strong></td>
</tr>
<tr>
<td><strong>Freq.</strong></td>
<td>31</td>
<td>88</td>
<td>55</td>
<td>101</td>
<td>71</td>
<td>346</td>
</tr>
<tr>
<td><strong>%</strong></td>
<td>9.0</td>
<td>25.4</td>
<td>15.9</td>
<td>29.2</td>
<td>20.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Select the information that you want to explore further

Place the cursor on the theme for actual figures

You also can rate your satisfaction level in this category

The sentiment charts will be updated automatically
Factual vs Perception Mapping

Map of actual crime statistics

Perceptions maps
Spikes and Triggers

Users Who Interact With mopedcyclediaries

Interactions Over Time

Choose a graph: Interactions

- Total Interactions
- Comments
- Wall Posts
- Likes

TOP THEMES

- Crime/Theft: 75% of total interactions
- Catering/Food: 20% of total interactions
- Transport/Vehicles: 5% of total interactions
- Law and Order

MATCH THEME TO SIGNAL

- Loss/Direction
- Crime/Theft
- Catering/Food
- Transport/Vehicles
- Law and Order

"It is not true you cannot get lost in Strasbourg" (23:54; 04/08/2010)

Crime/Theft. First occurred 09:38; 05/08/2010
Theme/over Time::PSNI Bangor FB
L~Derry/NI – BREXIT?

City of Culture 2013’s Photos - Post announcement photos
Photo 6 of 23 · Back to Album · City of Culture 2013’s Photos · City of Culture 2013’s Profile

Added July 15 · Comment · Unlike

You and 30 others like this.

Eamon Williams Even the cops are happy!
July 15 at 8:42pm · Like · 1 person · Flag

Geraldine Coyle Changed times - cops getting their beers on bakebook!! Well done Derry and all the hard workers.
July 15 at 8:51pm · Like · Flag

Corey Lendrum Hot brilliant, there’s an article on the Spectator and my mugshot on the front page with regards to the wallet found (}. Thanks guys, nice to make people realise that young people aren’t out to cause havoc about an hour ago · View Feedback (3) · Flag

Clandeboye Pike Was that was silver 106 that i seen stepped last night the one to do with the fireworks?
2 hours ago · View Feedback (6) · Flag

Linda Gamble hi we were wanted to have a few fireworks in r back garden for r kids do i need a license if so were do i get it and how much is it thanks
3 hours ago · View Feedback (0) · Flag

PSNI Bangor Neighbourhood officers have been giving a talk this morning at Bangor Academy warning Pupils of the dangers of fireworks and illegal possession and use of them. We will be continuing our foot and vehicle patrols in order to reduce the availability of illegal fireworks and also reporting/arresting any offenders we catch.
5 hours ago via Facebook for iPhone · View Feedback (30)

Leigh Gourley think there should be foot patrols in built up areas to stop the use of fireworks in those areas, my daughter is so close to get hit by one now she will not go out halloween rhyming because she is scared. I have seen kids letting fireworks off and them going a good bit down the road what if a car was coming down, think...
5 hours ago · View Feedback (4) · Flag

PSNI Bangor Response officers stopped and searched a vehicle at Queens Parade last night following the report of persons setting off fireworks. 12 packets of fireworks seized and the occupants of the car reported for the offences. Great result for those of you who have been suffering lately from Fireworks.
5 hours ago via Facebook for iPhone · View Feedback (2)

Charlie Gorman my two stony pups went missing from greenside last night if anyone find them please let me know
July 15 at 5:55pm · View Feedback (0)
Social Mention...
Create a cluster: The new LICA building has a wonderful use of materials, I'm looking forward to visiting.
A Semi-automated Display for Geotagged Text

Vincent A. Schmidt
Air Force Research Laboratory
Dayton, Ohio USA

Jane M. Binner
Sheffield Management School
University of Sheffield, UK
The Goal

Provide first responders and other analysts a mechanism for quickly identifying and responding to trends in social media data that indicate the status of a catastrophe or crisis.

In general:
Determine how social timestamped and georeferenced textual data (such as the data available in social media) can be effectively displayed to a specific end-user or analyst.
The Data

Source:
VAST 2011, Mini-Challenge 1
Characterization of an Epidemic Spread –
“determine the source of an epidemic disease and how it is spread throughout the community”

Interesting because:
a million uniquely identified records containing typical social networking data

Fields:
ID, Created_at, Location, text

3,5/18/2011 13:26, 42.22717 93.33772, this convention filled with technology could be better don't plan on leaving anytime soon

57,5/12/2011 21:08, 42.23363 93.34164, There's no point of trying if no one else is...

73,5/16/2011 5:28, 42.28818 93.33605, sick of hearing bout the Oil Spill now like

127,5/10/2011 16:53, 42.28051 93.34164, I hope #inception is as good as everyone says ten bux is ten bux...

238,5/9/2011 14:13, 42.21771 93.33845, ...I agree the most demanding task in our time is come to terms with space; so let time be our personal unit of confusion. ...

464,5/4/2011 20:04, 42.28523 93.44908, Isn't it weird that after all the hoopla about the TSA there was another 'near disaster' averted? Seems like it happens too much.
The Approach

Randomly choose 10000 records from the dataset

Find “conversations”: temporally close messages
Then, cluster “conversations” by location

Show how messages in a conversation inter-relate
Show geographic area, map conversations onto area

Allow user to examine conversation contents, message data, and message metadata
The Visualization

Sections include:
1. message relationships
2. geospatial data
3. conversations

Hover over message to see message text

Hover over histogram to see number of messages in a conversation
The Details: Clustering

(a) Original Data

(b) Sorted Data

(c) Consecutive Difference
The Implementation

Python 2.7.x
   – Multiplatform, rapid prototyping

Networkx graph library (networkx.lanl.gov)
Matplotlib graphic library

GTK user interface library
NLTK semantic processing library

Latest revision is around 800 LOC
Thank you: Any questions?

Safer Streets

SeeClickFix
power to the community

CITY SOURCED

Directgov | innovate

GovMetric

311

voiceyourview