

Big Data for Development: Mobile phone data could be used to prevent the spread of epidemics in developing countries

Posted on Thursday 2nd May 2013

BOSTON - Computer scientists at the University of Birmingham have devised a new set of models, using mobile phone data, for studying the geographic evolution of country-wide epidemics and for understanding and planning the diffusion of information among the population to advise on strategies to avoid spreading the infection further.

Their models are part of a submission that has won the Orange Data for Development Competition, announced at the MIT Media Lab at US conference NetMob'13 (1-3 May). This was a world-wide open data challenge with the goal of encouraging research teams to use datasets of anonymous mobile phone calls and SMS in Ivory Coast to address society development questions in new ways.

The researchers used the mobile call and SMS data – calls and texts from and to mobile phones, their time and date, and the location of callers/senders and recipients - to understand population movement, so that they could then devise a scenario of how an epidemic could easily spread and move to another area through infected people moving around. The understanding of the population movement might also be used to evaluate the effectiveness of quarantine measures.

By means of these datasets, the researchers also studied a possible method for targeting and contacting individual members of the population for promoting a vaccination campaign or other preventive measures by studying the patterns of mobile phone calls.

Dr Mirco Musolesi (<http://www.cs.bham.ac.uk/about/people/Mirco%20Musolesi>), Senior Lecturer from the University of Birmingham's School of Computer Science who led the project, said: *'We evaluated mechanisms for containing the epidemic spread of diseases and found that information campaigns based on one-to-one phone conversations among members of social groups might be an effective countermeasure in case of large-scale epidemics.'*

Mr Antonio Lima, a PhD student at the University of Birmingham involved in the project, added: *'The availability of this type of "big data" opens new possibilities for targeting global issues in new effective ways, which were not possible before. We are really only at the beginning. We believe that the societal impact of this type of research work can be really tremendous.'*

Ends

Notes to Editors

1. This research was funded by the **Engineering and Physical Sciences Research Council** (<http://www.epsrc.ac.uk/Pages/default.aspx>).
2. **Image showing disease containment in the Ivory Coast** (</Images/News/disease-containment-ivory-coast.jpg>).

Description: Geographic networks obtained from the mobility traces (left image) and the call logs (right). In the map on the left a link represents movements from a sub-prefecture to another one, whereas in the map on the right a link indicates calls from a region to another. Stronger links (i.e., higher number of movements/calls) are more opaque.

For further information

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