

Surveying African cities using Twitter

April 30 2014, by Jan Overney



Researchers are using Tweets to monitor the vital statistics of African cities. A first case study zooms in on the capital of Kenya, Nairobi.

Ask the local authorities how many people live in the city of Lausanne, Tokyo, or San Francisco, and they will offer up a relatively accurate number. Ask the same question in Kinshasa or Dar es Salaam, and they will be left guessing. Especially in the continent's less developed countries, African cities are statistically opaque, lacking quantitative information on measures as simple as [economic activity](#) and population counts. Now, researchers working with EPFL's Afrotech Future Africa Initiative are turning to Twitter, the online messaging service, as a free and powerful tool to fill some of these gaps.

Their first study focuses on the Kenyan capital, Nairobi, a city with a

diverse population of just over 3 million inhabitants, and seeks to develop ways to make sense of the data generated by Twitter users. "While each individual message, each Tweet, may contain only trivialities, analyzed in large numbers, they can reveal potentially interesting information," says Darshan Santani, a doctoral student at EPFL and Idiap in Switzerland. Santani set up a website that visualizes geo-localized [tweets](#) sent from Nairobi, Kenya.

On the screen, Tweets collected over a three-month period appear as dark red dots, densely lining the main roads that lead into Nairobi and the city center. Word clouds present the most frequently used words at various locations on the map, showing how the use of social media varies across the city. To extract valid information from the Tweets, they have to be analyzed in their sociological and geographic context.

The website presents about a dozen observations, interpretations of the data, made based on the content of the messages. "Tweeting does not mean production," says one, demonstrating that Tweets and economic activity do not go hand in hand. The data show that more Tweets leave golf clubs and upscale cafés than the economically productive industrial area. "Tweeting means money," says a second observation, highlighting one of the major challenges the researchers face: Tweets do not represent the entire population, as they are sent only by the middle and upper class. This is particularly obvious in informal settlements, where Tweets are typically sent by aid-workers.

For each new city they study, the researchers will form partnerships with local universities to help meaningfully interpret the data. A first collaboration is planned for this summer with IBM Research Africa in Nairobi. And as the number of collaborating institutions in Africa grows, so too should the number of collaborating labs at EPFL. "We are setting up the MIRROR group, a consortium of labs interested in interrogating large African datasets," says director of Afrotech Jonathan Ledgard.

"Our goal is to get all the labs on board whose work would be advanced by having access to this and other data sources, for example, to better understand the spread of infectious diseases or how a city's limits evolve over time."

The long-term objectives of the project go well beyond its current urban focus, and will include other sources of data. "More data will be produced in Africa in the coming years than in recorded history," says Ledgard. This, he says, will have a transformative effect across the continent, as long as methods to effectively mine these data are able to keep up with their generation. By providing access to these datasets and developing the methodologies needed to interrogate them, collaborative projects set up by the MIRROR group will contribute to making the most of this historic moment.

Provided by Ecole Polytechnique Federale de Lausanne

Citation: Surveying African cities using Twitter (2014, April 30) retrieved 11 July 2024 from <https://phys.org/news/2014-04-surveying-african-cities-twitter.html>

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