SUPERGRIDS:

A high power circuit breaker that could at last make DC control networks practical.

At ABB's lab in Sweden, hardware, for example, crowr shields—cleaned plates connected to frame circles—are utilized to test a high-voltage DC electrical switch. A powerful electrical switch could at last make DC contro networks reasonable.

High-voltage DC electrical cables can effectively transport power more than a huge number of kilometers and for long separations submerged, beating the AC lines that overwhelm transmission matrices now. In any case, for a century, AC won since high-voltage DC could be utilized just for indicate point transmission, not to frame the incorporated matrix systems required for a steady power framework.

The Swiss combination ABB has unraveled the fundamental specialized obstacle to such networks. It has built up a down to earth high-voltage DC electrical switch that disengages parts of the matrix that have an issue, permitting the rest to continue working.

DC frameworks would be more effective at interfacing far-flung wellsprings of renewable vitality, permitting utilities to normal out neighborhood varieties in wind and sun powered power while conveying energy to zones without much daylight or wind. Sunlight based power from the Sahara could control shady Germany, and twist control from all over Europe could keep the lights on around evening time. The outcome: more dependable renewable vitality that can better contend with fossil powers.

About STRIs Smart Grid lab: This laboratory provides researchers, product developers and manufacturers willing to demonstrate their products, with a platform to perform any needed testing and demonstration in a real-grid environment.

The most visible parts of the installation are the 200 square meters (30 kW) of solar panels and a micro wind turbine. The facilities also include fuel cells, hydrogen electrolyzer, super capacitors, wireless sensor networks and our newest addition, a 30kW/20 kWh battery storage installation using the latest Lithium Ion technology as well as state-of-the-art IEC 61850 communication and converter connecting the batteries to the grid and enabling island operation.

The laboratory is fully integrated with the local distribution system including dedicated 12 kV transformer and medium voltage substations at STRI. The installation also contains a lot of invisible parts that are equally important and that contribute to making this a unique installation such as full scale SCADA system and a large communication network with latest in time synchronization and IT security.

ADVISORY COMMITTEE

Dr. Prashant C S R
Prof & Head Dept of CSE

Prof. N. Deepika
Dept OFCSE

STUDENT EDITORS

Ashwin Uday Kumar

Adithya Sunil Nair

P1 / SMARTWATCH
Utilizes Bluetooth to interface remotely to an iPhone or Android telephone and shows notices, messages, and other basic information.

P2 / MICROSOFT BUY NOKIA
Microsoft will pay €3.79 billion for Nokia's business, plus another €1.65 billion to license it portfolio of patents.

P3 / U CAST DEVICE
The device sends tiny vibrations in order to heal the bone faster than a conventional cast

P4 / 3D PRINTER
Allowing virtually created objects to be used as models for hard copies made from plastics, metal alloys or other materials

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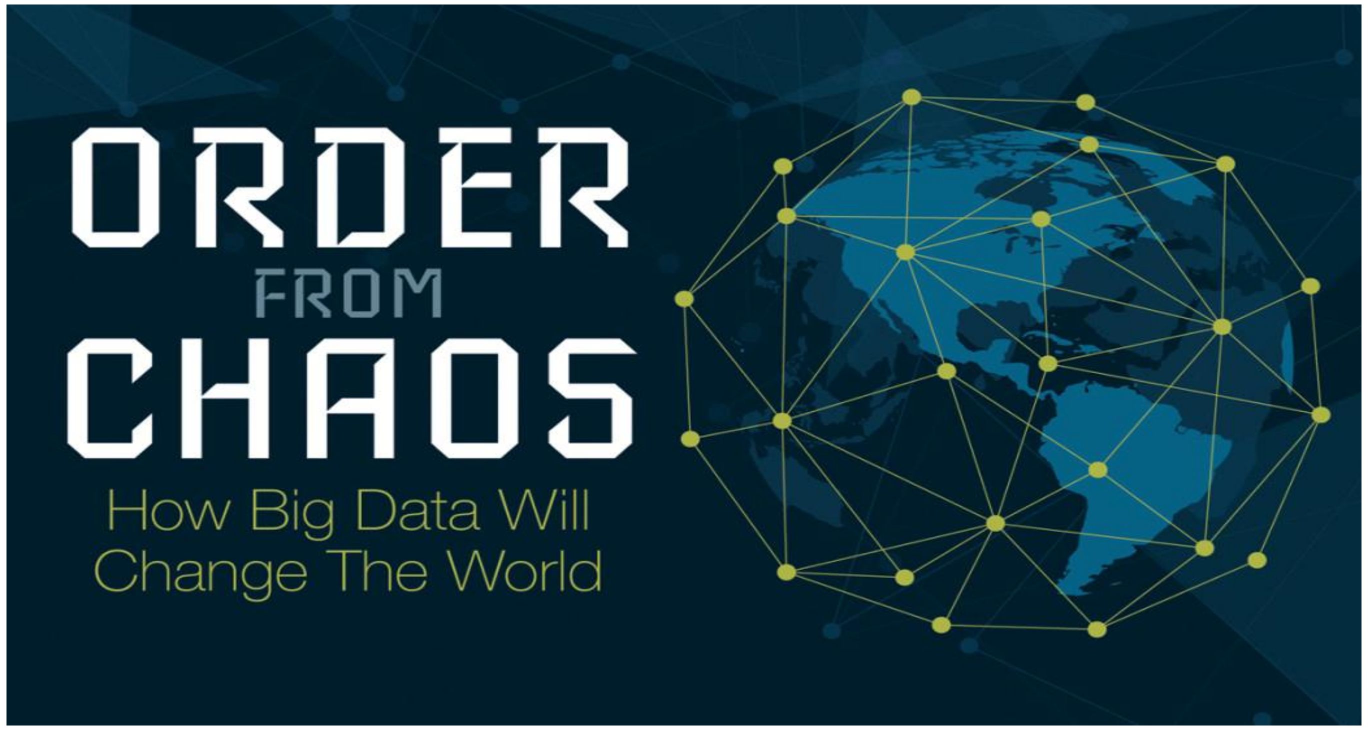
ACE / Q1 / SEP 2013

Collecting and analyzing information from simple cell phones can provide surprising insights into how people move about and behave—and even help us understand the spread of diseases.



At a computer in her office at the Harvard School of Public Health in Boston, epidemiologist Caroline Buckee points to a dot on a map of Kenya's western highlands, representing one of the nation's thousands of cell-phone towers. In the fight against malaria, Buckee explains, the data transmitted from this tower near the town of Kericho has been epidemiological gold.

When she and her colleagues studied the data, she found that people making calls or sending text messages originating at the Kericho tower were making 16 times more trips away from the area than the regional average. What's more, they were three times more likely to visit a region northeast of Lake Victoria that records from the health ministry identified as a malaria hot spot. The tower's signal radius thus covered a significant waypoint for transmission of malaria, which can jump from human to human via mosquitoes. Satellite images revealed the likely culprit: a busy tea plantation that was probably full of migrant workers. The implication was clear, Buckee says. "There will be a ton of infected [people] there."

This work is now feeding into a new set of predictive models she is building. They show, for example, that even though malaria cases were seen at the tea plantation, taking steps to control malaria there would have less effect on the disease's spread than concentrating those efforts at efforts at the source: Lake Victoria. That region has long been understood as a major center of malaria, but what hasn't been available before is detailed information about the patterns of human travel there: how many people are coming and going, when they're arriving and departing, which specific places they're coming to, and which of those destinations attract the most people traveling on to new places.

Caroline Buckee, a Harvard epidemiologist, is using detailed data on population movements—gleaned from mobile phones— to build precise new tools for fighting the spread of malaria.

The data mining will help inform the design of new measures that are likely to include cheap, targeted campaigns of text messages—for

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for example, warning visitors entering the Kericho tower's signal zone to use bed netting. And it will help officials choose where to focus mosquito control efforts in the malarial areas."This is the future of epidemiology. If we are to eradicate malaria, this is how we will do it."

That demonstration suggests how such data might be harnessed to build tools that health-care workers, governments, and others can use to detect and monitor epidemics, manage disasters, and optimize transportation systems. Already, similar efforts are being directed toward goals as varied as understanding commuting patterns around Paris and managing festival crowds in Belgium. But mining phone records could be particularly useful in poor regions, where there's often little or no other data-gathering infrastructure. "We are just at the start of using this data for these purposes," says Vincent Blondel, a professor of applied mathematics at the University of Louvain in Belgium and a leading researcher on data gleaned from cell phones. "The exponential adoption of mobile phones in low-income settings—and the new willingness of some carriers to release data—will lead to new technological tools that could change everything."