

Smartphones as seismometers intrigue Berkeley researchers

December 7 2012, by Nancy Owano

(Phys.org)—Researchers at the Berkeley Seismological Laboratory want to table smartphones as pocket-sized seismometers. The phones used as warning systems could make a life or death difference in the seconds one might have before meeting up with the next event. "We are trying to set up a whole new network of smartphones so we can use the accelerometers in the smartphones to detect earthquakes," a team spokesman told BBC News. With so many devices in circulation, detailed information could be known on who felt what, where.

"Smartphones carry all sorts of sensors, and we can put these to use in unexpected ways," said Qingkai Kong. "Right now, we can only detect earthquakes above about Magnitude 5.0, but with better [accelerometers](#) in future smartphones we would hope to detect smaller ones as well."

The key enabler in smartphones for this type of work is in their accelerometers, that can detect and record movement and may monitor tremors. An app is being developed that will record the shaking during major events and then report the data back to a central server over the cell network.

But what good is short notice when an earthquake is on its deadly way? Advance notice even in seconds is actually of value, as the BBC report noted, in not only giving people time to take cover but for trains to slow or planes to abort landings or for surgeons to manage their procedures knowing the event is on its way.

The theory is that a [smartphone seismic network](#) would feed directly into the [early warning system](#), having detected faster moving but not as damaging P-waves ahead of S-waves in an event.

The Berkeley initiative was made known at the [American Geophysical Union](#) Fall meeting. As phones would be mobile and not sitting still on a flat surface, the researchers handled this by developing an algorithm to subtract "noise" in the data. The project is at an early stage.

The topic of earthquakes hits very close to home at this lab; the Hayward Fault, which many scientists suspect is a potential trigger for a major earthquake in the San Francisco Bay Area, runs through the UC Berkeley campus. According to scientists and engineers in a 2008 report, it has a 31 percent probability of rupturing in a magnitude 6.7 or greater earthquake within the next 30 years. The team hopes to provide a test app next year to volunteers in the Bay Area.

Actually, according to an observation from the California Institute of Technology (Caltech) noted earlier this year, Internet-enabled devices, not just smartphones, but also laptops and game consoles now have accelerometers that can be used to [detect](#) and measure earthquakes.

"Harnessing the data from these sensors could allow us to quickly detect large earthquakes, and accurately estimate where damage has occurred and where emergency responses are needed shortly after a quake."

Nonetheless, it added, smartphones have a powerful collection of sensors like GPS, accelerometers, and gyroscopes that make phones an ideal platform for collecting data about how a community experiences an [earthquake](#).

More information: seismo.berkeley.edu/outreach/hayward_fault.html

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