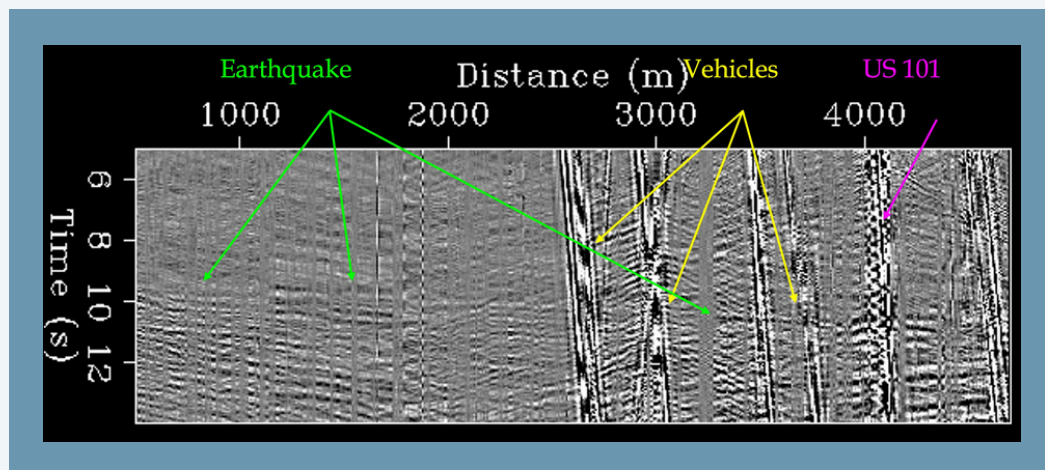


Large-scale monitoring of urban environments by fiber-optic seismology: lessons from eight years of the Stanford DAS project

ABSTRACT

The capability of turning fiber-optic cables into seismic sensors has the potential of providing datasets that “illuminate” Earth processes in a way that would be impossible with data recorded by conventional seismic sensors. Fiber-optic seismology enabled by Distributed Acoustic Sensing (DAS) technology can produce continuous and densely sampled data recorded from difficult to access locations and at an affordable cost.



In my presentation I will focus on the opportunities for leveraging ubiquitous telecommunication fiber cables with distributed acoustic sensing (DAS) to make cities more sustainable and resilient to climate change. We can use of “dark fibers” in urban environment to monitor both human activities above the surface (e.g. vehicular traffic, urban noise) as well as possibly hazardous natural phenomena

occurring in the subsurface (e.g. earthquakes, water intrusion, landslides). DAS data from dark fibers also enables cost-effective monitoring of structural health of urban infrastructure such as bridges and tunnels.

I will also present the challenges to fully realize these goals and discuss the opportunities for students to develop and apply their technical skills in signal processing, machine learning, and geophysical inversion and to lead the development of this exciting new research field that will have an important role in supporting the long-term sustainability of our cities.

MAY 9th 2024, 11 AM, DIATI DOOR 3, MEETING ROOM 1st FLOOR

BIO

Biondo Biondi is the Barney and Estelle Morris Professor and Chair of the Geophysics Department at Stanford University. He is director of the Stanford Earth imaging Project (SEP). SEP is an industry-funded academic consortium whose mission is to develop innovative seismic imaging methodologies and to educate the next generation of leaders in applied seismology. SEP has pioneered innovations in 3-D seismic imaging and processing for more than 50 years. Today, it is continuing to make important contributions to the research on data analysis and imaging with an increasing focus on novel applications to support the ongoing energy transition.

In 2004 the Society of Exploration Geophysicists (SEG) honored Biondo with the Reginald Fessenden Award. In 2007 Biondo was the SEG/EAGE Distinguished Short Course Instructor.



Professor
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