

Biography of Luigi Zanzi

Luigi Zanzi received his M.S. (1984) and Ph.D. (1991) in electrical engineering from Politecnico of Milano. During the winter quarter of 1988 he was visiting student at the Department of Geophysics of the Stanford University (CA) working with the research group led by Prof.J.Claerbout.

From 1991 to September 2001 he was assistant professor of Applied Geophysics at the Politecnico of Milano and worked in the research group led by Prof.F.Rocca at the Electronic and Information Department. Since September 2001 he is full professor of Applied Geophysics at the Politecnico of Milano and he leads the research group on geophysical methods for civil and environmental engineering at the Department of Civil and Environmental Engineering.

His areas of professional interest are seismic, radar and sonic signal processing and the development of geophysical methods for any engineering application. The research activities in seismics are dedicated to refraction static corrections, deep seismics for crustal studies (Italian CROP project), converted wave processing, migration operators, passive seismics for monitoring systems. The research activities in radar data processing are dedicated to the application of the Ground Penetrating Radar for Non Destructive Testing on historical buildings, for archeological studies, for landmine detection, for subsurface utility mapping, for contaminated site assessment, etc.. Many of these applications are currently approached with 3D radar experiments and he is developing methods aimed to speed up both the acquisitions and the processing of the 3D data. He is also working on the development of algorithms for radar and sonic tomographic and imaging techniques. For the improvement of these radar applications, he investigated the GPR antenna behaviour in the near field producing some contributions on the numerical integration and the experimental measurements of the GPR antenna directivity function.

In recent years, he has been involved in several research projects funded by the European Community: a Joule project (contract JOU2-CT92-0099) on seismic applications for hydrocarbon exploration, an ESPRIT project ("HOPE") on the development of a multi-sensor system for humanitarian demining, an EESD project ("ONSITEFORMASONRY") on the development of NDT techniques for diagnostic investigations on masonry buildings, another EESD project ("HYGEIA") on the development of geophysical methods for the assessment of contaminated sites. He was responsible for a contract with the Joint Research Centre in Ispra on the use of radar systems for 3D near-field imaging. He has been participating in several projects funded by the Italian Government (on the development of NDT techniques on historical buildings) and by the National Research Council (on the integration of seismic and seismological data for the study of the source mechanism of the earthquakes in some Italian regions).

He has been responsible for the research activities of the Applied Geophysics group within the projects of Politecnico di Milano regarding Civil Protection issues (PROMETEO project). Specifically, he has been working on the development of the geophysical techniques for assessment and monitoring of unstable rock slopes and dismissed mines. On these subjects, he has been working on the design and installation of a microseismic monitoring network for the surveillance of an unstable rock slope. The network is currently operating and L.Z. is coordinating the activities for data processing and interpretation. Concerning the topic of dismissed mines, L.Z. has been working in cooperation with the team of Politecnico di Milano involved in the assessment of the Montevicchia mine by designing and carrying out the seismic investigations (refraction, MASW, transillumination measurements). Within the framework of the PROMETEO project, L.Z. has been also working on the application of

detecting and locating survivors buried in building debris after major disasters like earthquakes. For the last application, he was responsible of the research activities of Politecnico di Milano for the development of a localization system based on the detection of microseismic events (project SOS-TEAM funded by Regione Lombardia).

He is responsible within the project PROACTIVE funded by Regione Lombardia for the research activities dedicated to the development of sensor networks (microseismic, resistivity, temperature, rain, ...) for monitoring water filtration and erosion problems in urban and rural environments.

Currently he is scientific responsible of the project TECH-LEVEE-WATCH funded by CARIPLO foundation for the development and testing of assessment and monitoring technologies to be applied on earth levees.

He is responsible for the activity of his group in several projects funded by local authorities and private institutions concerning the development of geophysical techniques for subsurface utility mapping, assessment of safety conditions of embankments, NDT of historical buildings, archeological investigations. A recent result of the activity of his research group is a new system for 3D GPR acquisitions that has been patented by Politecnico di Milano.

He coordinates many geophysical investigation projects executed by the laboratory of his department and funded by local authorities or by local private companies.

He has published more than 140 contributions on the international scientific literature of the geophysical and NDT sectors.

He was visiting Professor at the University of Miami in the 2009-2010 academic year.

He is member of some international geophysical societies (EAGE and SEG) and was President of the Italian section of EAGE-SEG in 2009-2010. From 2005 to 2014 he was also member of the RILEM Technical Committee SAM (Strategies for the assessment of historic masonry structures with NDT).

He received the EAEG Van Weelden Award in 1990.

Main publications

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