

Short Curriculum Vitae of Prof Umberto Spagnolini

Prof. Umberto Spagnolini graduated cum laude as Dottore in Ing. Elettronica (in 1988). In 1990 he joined the Dipartimento di Elettronica e Informazione, Politecnico di Milano as a Faculty member. Currently he is Full Professor in Telecommunications (since 2006) with research and teaching in Communication Systems, Statistical Signal Processing, and Advanced Topics on Signal Processing for Wireless Communication Systems.

During the 20+ years of his scientific activity, he covered several application areas ranging from radar systems, oil exploration, signal processing for cellular systems and wireless networks. He is author of more than 250 papers on peer-reviewed journals/conferences (see <http://home.deib.polimi.it/spagnoli/> for details on specific areas of expertise; h-index=25) and he has been involved in several editorial activities and technical program committees of scientific conferences. He is Senior Member of IEEE and member of SEG and EAGE; member of the European-supported Network of Excellence on Wireless COMmunication (NEWCOM/++) since its founding.

Prof. Spagnolini has been coordinating a group of people ranging from 4 to 12 researchers depending on the research projects (and 2 Faculty members). More specifically, he rose founding for research activities, mostly from private companies as he always managed his group to trade the results of the medium/long term fundamental research activities with the short-term needs of the industry. He filed 17 patents in innovative areas/products, mostly in partnership with telecommunication industry (e.g., Italtel, Siemens, Nokia Siemens Networks). He has been acting as technical experts in patent infringements (Nokia vs ICom, and Apple vs Samsung), of UNINFO for intelligent transportation system regulations, and of KRIA for traffic-lights monitoring and controllers.

In 1992 he developed the first non-destructive test system to evaluate the quality of the asphalt of road and highway in cooperation with Società Autostrade (the leading highway contractor in Italy). The system was based on the ground penetrating radar (GPR) concept and most of the methodologies developed during this cooperation have now become routinely employed approaches to GPR pavement profiling. For these innovative methodologies, he was appointed in 1995 Member of Instrumentation and Future Technologies board for GPR and in 1999 he became Associate Editor of the prestigious IEEE Transactions on Geoscience and Remote Sensing for the area of subsurface processing.

He has developed innovative seismic-based methods and algorithms to improve the subsurface imaging in close cooperation with oil companies (ENI) and contractors (Schlumberger). In the field of oil exploration, in 1994-1998 he proposed and developed the 3D Shot Continuation Operator, a new proprietary method that dramatically reduced the cost of 3D seismic acquisition. In 2006 the 3D-SCO was released to ENI oil company as one of the most advanced data-interpolation tool in seismic exploration.

In 1998-1999 he founded within the Politecnico di Milano, the WiSyLAB (Wireless System LABORatory). The group cooperated with Italtel and Siemens in the design of the first GSM-compliant smart-antenna basestation with a self-calibrating array of 8 antennas. The most innovative part that made the system competitive was based on a patent developed by WiSyLAB. Since 1999, his research group developed, in close partnership with Siemens, new technologies

based on the multiple-antennas concept to improve the capacity of advanced cellular systems. The most relevant industrial results and patents of WiSyLAB are on PHY, MAC and RRM for WCDMA (TDD mode), UMTS/HSPA and WiMAX systems.

In 2006 he founded WiSyTech (Wireless System Technology), a spin-off company of Politecnico di Milano, with the mission to design reconfigurable wireless devices for WiMAX, LTE and MIMO systems. In 2011 he founded Medielma (Medical Electromagnetic), a start-up company for early-diagnosis of prostatic cancer based on electromagnetic methods.

Since 2005 he led the research activities of WiSyLAB on the new hot-topic of wireless sensor networks with emphasis on a strong international cooperation. The main WiSyLAB contributions are in the field of network synchronization (2 international scientific awards from IEEE), localization methods, battery-aware cooperative communications, cognitive radio systems, and ultra-wide band (UWB) communications. Projects over the last few years are on wireless networks for industrial applications in oil exploration and refineries (ENI-SAIPEM), for railway signaling (RFI, Ansaldo-STS, Sirti, Bombardier), critical control and smart metering systems (FP7-DIWINE, 2013-15).

Since the beginning of his academic activities, he tutored more than 130 MSc and 18 PhD students that are now with oil exploration companies, telecommunication industries and academia all around the world. This virtual community of alumni provides a continuous feedback to better focus the basic-research towards the most industrially active applications.

He is active in oil exploration to make the 3D data-acquisition cost/quality-effective by exploiting the recent advances in wireless sensor networks. WiSyGEO is his new project aimed to replace cable connectivity by wireless in oil exploration that benefits from the 20+ years of experiences on all the application fields. WiSyGEO was awarded at Start Cup 2008, the start-up competition in Lombardia.

His current interests/projects are in network MIMO and multiuser processing for LTE femtocell systems, synchronized MAC/PHY protocols for distributed wireless sensor networks, localization and navigation systems, MAC/PHY protocols for energy-harvested nodes, Bayesian methods for vehicular traffic managements.

Publications and detailed Curriculum Vitae is in : <http://home.deib.polimi.it/spagnoli/>