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The Internet of Things: A survey

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Abstract

This paper addresses the Internet of Things. Main enabling factor of this promising paradigm is the integration of several technologies and communications solutions. Identification and tracking technologies, wired and wireless sensor and actuator networks, enhanced communication protocols (shared with the Next Generation Internet), and distributed intelligence for smart objects are just the most relevant. As one can easily imagine, any serious contribution to the advance of the Internet of Things must necessarily be the result of synergetic activities conducted in different fields of knowledge, such as telecommunications, informatics, electronics and social science. In such a complex scenario, this survey is directed to those who want to approach this complex discipline and contribute to its development. Different visions of this Internet of Things paradigm are reported and enabling technologies reviewed. What emerges is that still major issues shall be faced by the research community. The most relevant among them are addressed in details.

Keywords

Internet of Things; Pervasive computing; RFID systems

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Luigi Atzori is assistant professor at the University of Cagliari (Italy) since 2000. His main research topics of interest are in multimedia networking: error recovery and concealment, IP Telephony, video streaming, network QoS management. He has published more than 80 journal articles and refereed conference papers. He has been awarded a Fulbright Scholarship (11/2003–05/2004) to work on video at the University of Arizona. He is editor for the ACM/Springer Wireless Networks Journal and is involved in the organization of several International Conferences on Multimedia Networking.



Antonio Iera is a Full Professor of Telecommunications at the University "Mediterranea" of Reggio Calabria, Italy. He graduated in Computer Engineering at the University of Calabria in 1991; then he received a Master Diploma in Information Technology from CEFRIEL/Politecnico di Milano and a Ph.D. degree from the University of Calabria. From 1994 to 1995 he has been with Siemens AG in Munich, Germany to participate to the RACE II ATDMA (Advanced TDMA Mobile Access) project under a CEC Fellowship Contract. Since 1997 he has been with the University Mediterranea, Reggio Calabria, where he currently holds the positions of scientific coordinator of the local Research Units of the National Group of Telecommunications and Information Theory (GTTI) and of the National Inter-University Consortium for Telecommunications (CNIT), Director of the ARTS "Laboratory for Advanced Research into Telecommunication Systems, and Head of the Department DIMET. His research interests include: new generation mobile and wireless systems, broadband satellite systems, Internet of Things. Elevated to the IEEE Senior Member status in 2007.



Giacomo Morabito was born in Messina, Sicily (Italy) on March 16, 1972. He received the laurea degree in Electrical Engineering and the Ph.D. in Electrical, Computer and Telecommunications Engineering from the Istituto di Informatica e Telecomunicazioni, University of Catania, Catania (Italy), in 1996 and 2000, respectively. From November 1999 to April 2001, he was with the Broadband and Wireless Networking Laboratory of the Georgia Institute of Technology as a Research Engineer. Since April 2001 he is with the Dipartimento di Ingegneria Informatica e delle Telecomunicazioni of the University of

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