

ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

DET/Comitato ICT - Machine learning based solutions to monitor real-time communications

Funded By	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [Piva/CF:97429780584] COMITATO PER LA GESTIONE DEL FONDO PER LO SVILUPPO DELLA RICERCA E DELLA FORMAZIONE NEL SETTORE DELL [Piva/CF:97623280019]
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Context of the research activity	Several innovative applications are based on real-time communications for which quality monitoring is crucial. The research objective consists in the development of a monitoring framework that is based of machine learning algorithms for quality assessment implemented in architectures that make use of resources and devices at the edge of the network integrated in innovative optical transport networks based on optical transmission and switching.
Objectives	<p>The research aims to develop an energy efficient machine learning based framework for monitoring the quality of real-time communications that are the basis of machine-to-machine interactions typical of several applications in Smart City scenarios. The monitoring system can be the basis of techniques for identifying anomalies in the functioning of network infrastructures and detecting possible cyber attacks on the network.</p> <p>Quality monitoring will be carried out by combining different data sources located at the edge of the network and in user terminals, identifying the correlations present between the data collected from the various sources, and inferring from these the operating conditions of the network.</p> <p>To enhance the energy efficiency of the monitoring framework, the research will investigate the possibility to implement the monitoring functions through NextGen/IoT devices integrated in innovative optical transport networks based on optical transmission and switching. The framework integrated in the innovative optical transport networks will become a case study of the Zero-Touch end-to-end Optical Networks (ZeTON) project - project CUPE53D23001050006 funded from the call "Bando PRIN 2022" (Decreto Direttoriale del Mur n. 104 del 2 febbraio 2022) and funded by the European Union Next Generation EU program "Piano Nazionale di Ripresa e Resilienza (PNRR), Missione 4 Componente 2 Investimento 1.1 "Fondo per il Programma Nazionale di Ricerca e Progetti di Rilevante Interesse Nazionale</p>

(PRIN)".

**Skills and
competencies
for the
development of
the activity**

Knowledge on communications and networking, energy efficiency and sustainability of ICT. Programming skills. Competence on machine learning techniques.