Experimental demonstration of a cognitive quality of transmission estimator for optical communication systems

The impact of physical layer impairments in optical network design and operation has received significant attention in the last years, thereby requiring estimation techniques to predict the quality of transmission (QoT) of optical connections before being established. In this paper, we report on the experimental demonstration of a case-based reasoning (CBR) technique to predict whether optical channels fulfill QoT requirements, thus supporting impairment-aware networking. The validation of the cognitive QoT estimator is performed in a WDM 80 Gb/s PDM-QPSK testbed, and we demonstrate that even with a very small and not optimized underlying knowledge base, it achieves between 79% and 98.7% successful classifications based on the error vector magnitude (EVM) parameter, and approximately 100% when the classification is based on the optical signal to noise ratio (OSNR).

General information
Publication status: Published
Organisations: Department of Photonics Engineering, Metro-Access and Short Range Systems, Coding and Visual Communication, University of Valladolid
Pages: B64-B70
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Optics Express
Volume: 20
Issue number: 26
ISSN (Print): 1094-4087
Ratings:
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 3.85 SJR 2.823 SNIP 2.221
Web of Science (2012): Impact factor 3.546
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Original language: English
Electronic versions:
E385Bd01.pdf
DOIs:
10.1364/OE.20.000B64

Bibliographical note
This paper was published in Optics Express and is made available as an electronic reprint with the permission of OSA. The paper can be found at the following URL on the OSA website: http://www.opticsinfobase.org/oe/abstract.cfm?uri=oe-20-26-B64. Systematic or multiple reproduction or distribution to multiple locations via electronic or other means is prohibited and is subject to penalties under law.
Research output: Contribution to journal › Journal article – Annual report year: 2012 › Research › peer-review