Using Deep Learning for the Detection of Faulty RJ45 Connectors on a Radio Base Station

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Abstract : A radio base station (RBS), part of the radio access network, is a particular type of equipment that supports the connection between a wide range of cellular user devices and an operator network access infrastructure. Nowadays, most of the RBS maintenance is carried out manually, resulting in a time consuming and costly task. A suitable candidate for RBS maintenance automation is repairing faulty links between devices caused by missing or unplugged connectors. A suitable candidate for RBS maintenance automation is repairing faulty links between devices caused by missing or unplugged connectors. This paper proposes and compares two deep learning solutions to identify attached RJ45 connectors on network ports. We named connector detection, the solution based on object detection, and connector classification, the one based on object classification. With the connector detection, we get an accuracy of 0:934, mean average precision 0:903. Connector classification, get a maximum accuracy of 0:981 and an AUC of 0:989. Although connector detection was outperformed in this study, this should not be viewed as an overall result as connector detection is more flexible for scenarios where there is no precise information about the environment and the possible devices. At the same time, the connector classification requires that information to be well-defined.

Keywords : radio base station, maintenance, classification, detection, deep learning, automation

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