

# A Semi-Supervised Location-Aware Anomaly Detection Method for Ultra-Dense Indoor Scenarios

Javier Villegas, Sergio Fortes\* and Raquel Barco

Telecommunication Research Institute (TELMA), Universidad de Málaga,  
E.T.S. Ingeniería de Telecomunicación, Bulevar Louis Pasteur, 35, Málaga,  
29010, Málaga, Andalucía, Spain  
Email: {jvc, sfr, rbm}@ic.uma.es

**Abstract**—Over the past few years, indoor cellular deployments have been on the rise. These scenarios are characterized by their user density and fast-changing conditions, thus, being prone to failures. Moreover, the steady development of indoor and outdoor positioning techniques is expected to provide a reliable source of information. Thus, the availability of user location is being considered to be a key enabler to improve the resilience and performance of automatic failure management and optimization techniques. Taking this into consideration, the present work proposes a semi-supervised location-aware anomaly detection method for the management of failures such as cell outages and interference problems.