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DEGLI STUDI
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Department of Cardio-
Thoracic-Vascular Sciences
and Public Health



Biostatistics, Epidemiology
and Public Health Unit



Journal Club

"A weighted patient network-based framework for predicting chronic diseases using graph neural networks" by Lu & Uddin

Speaker:

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Moderator:

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Abstract:

Chronic disease prediction is a critical task in healthcare. Existing studies fulfil this requirement by employing machine learning techniques based on patient features, but they suffer from high dimensional data problems and a high level of bias. Lu & Uddin propose a framework for predicting chronic disease based on Graph Neural Networks (GNNs) to address these issues. The authors begin by projecting a patient-disease bipartite graph to create a weighted patient network (WPN) that extracts the latent relationship among patients. They then use GNN-based techniques to build prediction models. These models use features extracted from WPN to create robust patient representations for chronic disease prediction. Lu & Uddin compare the output of GNN-based models to machine learning methods by using cardiovascular disease and chronic pulmonary disease. The results show that their framework enhances the accuracy of chronic disease prediction. The model with attention mechanisms achieves an accuracy of 93.49% for cardiovascular disease prediction and 89.15% for chronic pulmonary disease prediction. Furthermore, the visualisation of the last hidden layers of GNN-based models shows the pattern for the two cohorts, demonstrating the discriminative strength of the framework. The proposed framework can help stakeholders improve health management systems for patients at risk of developing chronic diseases and conditions.

Thursday 6th April, from 12:30 a.m. to 2:00 p.m.
Aula Cardiologia - Centro Galluci
Via Giustiniani 2 - Padova

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