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# A pattern mixture model with long short-term memory network for acute kidney injury prediction

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Acute kidney disease is a serious complication characterized by poor short- and long-term outcomes in the intensive care unit. Impairment in renal function of the kidney significantly increases the mortality rate. Early detection of acute kidney disease could lead to preventive interventions, therefore deep learning systems can detect it before its symptoms and consequences appear. We developed a novel deep learning architecture like Stacked long short-term memory network with pattern mixture approach for kidney injury prediction. A total of 33,754 patients encountered were retrospectively analyzed from the MIMIC-III database. A selection and pattern mixture model was used for preprocessing the time-series data. We compared the proposed result with conventional algorithms like gradient boosted trees and long short-term memory model. Our model was trained on patient time-series data for different time windows and obtained the highest accuracy of 92.4% for 12 h and 92.6% for 24 h. A novel stacked long short-term memory model outperforms the machine learning model, revealing superior performance in predicting kidney injury 24 h before onset. © 2023 The Authors

## Author keywords

Deep learning; Kidney disease; Long short term memory; Pattern mixture

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