



An Analytical Study of Areas with Intellectual Disability in East Java and Their Prediction Using Ensemble Filtering

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Abstract: According to the WHO, intellectual disability refers to individuals with limited intellectual abilities, who face difficulties in meeting basic needs. This condition affects both children and adults, with children requiring full support from parents and their environment, as they are prone to discrimination. It is common in several Indonesian provinces, notably West Java, Central Java, and East Java, particularly in rural or remote areas where access to health facilities and knowledge is limited. In this study, the prevalence of intellectual disability in East Java is analyzed and predicted using machine learning methods based on the number of affected regions per district/city. The methods applied are the Ensemble Kalman Filter (EnKF) and Ensemble Kalman Filter Square Root (EnKF-SR), both of which are developments of the Kalman Filter. The EnKF method achieved the best RMSE of 50.68 with 600 ensembles and $R = 0.01$, while the EnKF-SR achieved the best RMSE of 69.16 with 800 ensembles and R values of 0.01 and 0.03.

Keywords: *intellectual disability; East Java; prediction; machine learning; ensemble filtering.*

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