

Title: Transformer Modelling on Autoencoded Neuronal Signals to Predict Relative Joint Angle Displacement

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Abstract: We look to expand on the work done in the Donoghue Lab on using machine learning to predict joint angle displacement using neuronal signal time series data collected from monkeys. Past work has focused on using regression and Kalman filtering to predict displacement using the time series. We looked to use a two phase model consisting of an autoencoder to learn a more useful representation of the high-dimensional neural data and a transformer to map these autoencoded signals into displacement vectors. While not perfect, this approach demonstrated predictive power in reconstructing joint angle displacement time series. The model was limited by a lack of training data, and we believe that future work with a larger dataset could improve performance significantly.