



Figure 4 – figure supplement 2: Kinematic model of firing rate responses. Firing rates were regressed on movement acceleration and speed. (A–F) The actual firing rates (light lines) and the model fits (dark lines) are shown for Reach (A, B), Planned Turn (C, D), and Impromptu Turn (E, F) trials. Regressions were performed on a fraction of data (time-points indicated by grey horizontal lines); out of sample firing rate predictions are shown (time points indicated by black horizontal lines). The model closely matches the data except for high predicted firing rates which correspond to high movement velocities and accelerations; this likely reflects a firing rate bound or non-linearity for fast movements that is not captured by our linear model. The fits were performed using time-lagged speed and acceleration with the lags optimized to achieve the best fit. The adjusted R^2 of the fits with different time lags for different units are shown for Movement Units (G) and Turn Units (H). The highest adjusted R^2 for each unit determined the best-fit time lags in Fig. 4G, H.