Holt-Winters algorithm in Influenza-like illness Forecasting

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August 29, 2018

Holt-Winters Algorithm has Three Terms

$$\hat{y}_{t+\Delta t} = \bar{y}_t + \Delta t \times s_t + c_{t,\Delta t} \tag{1}$$

where $\Delta t = \#$ of week predicted ahead

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The smoothing factors $0 \leq \alpha, \beta, \gamma \leq 1$ are determined by minimizing the mean square error of the residuals.

The Holt-Winters Algorithm allows other factors to be included in the correction term.

To include the impact of the humidity, we define

$$h_t = \text{humidity in week t}$$

and update the seasonality correction as

$$c_{t,L} = \gamma(y_t - \bar{y}_t) + (1 - \gamma)\boxed{\frac{h_t}{h_{t-L}}}c_{t,0} \tag{2}$$