PyCipio: Bayesian Time-series Prediction

Mikkel Werling

201706722

27/05/2021

1 Introduction

1.1 Time Series Forecasting

1.2 Decomposition of a Signal

$$y(t) = g(t) + s(t) + \varepsilon$$

$$y(t) = g(t) \cdot s(t) \cdot \varepsilon$$

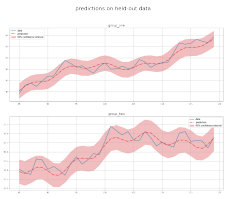
$$g(t) = \alpha + \beta \cdot x$$

$$s(t) = \sum_{n=1}^{N} \left(a_n cos(\frac{2\pi nt}{P}) + b_n sin(\frac{2\pi nt}{P}) \right)$$

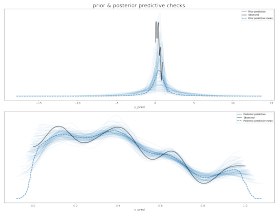
$$F(t) = \left[cos(\frac{2\pi 1t}{7}), \ldots, sin(\frac{2\pi 8t}{7}) \right]$$

$$s(t) = F(t) \cdot \omega$$

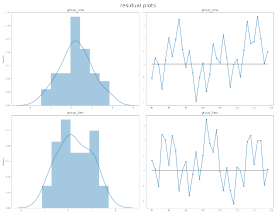
$$y(t) = alpha + beta \cdot x + s_1(t) + s_2(t)$$



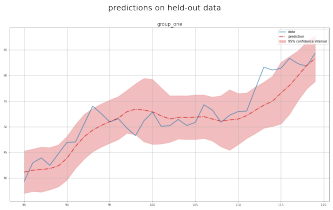
(a) First plot



(b) Second plot



(c) Third Plot



(d) Fourth plot

Figure 1: Predictions in one and 2 groups