Dec 22 Meeting Notes

22/12/2020

SEIR Compartment Model

- Higher focus on removed loss compared to infected cases as it is on different scales and the infected cases has higher noise
- Step 1
  - Time varying parameters α_1, α_2.. for time periods under different policies. In this case α_i are independent of each other and they each cover wide time periods.
- Step 2
  - Time varying parameter as a function $\alpha_t = f(\phi_t)$. In this case α_t is assumed to be dependent and related by some parameter ϕ_t.
- Extra compartments such as unobserved infected cases could lead to problems related identifiability with the interaction between the Exposed and Unobserved Infected compartments.
- Notice that currently this model produces predictions and forecasts $\hat{Y_1}, \hat{Y_2}, ..., \hat{Y_{t+h}}$ given only the estimated parameters. Instead to make it more presentable we will use Y_{t-1} as the initial values to get $\hat{Y_t}$ with IVP solver (one step prediction) and use latest known Y_t to get h step future forecasts $\hat{Y_{t+1}}, ..., \hat{Y_{t+h}}$

Poisson Regression

- Notice relationship between poisson model definition and the ODEs for the SEIR model. Look into more detail if we can relate them somehow.
- This model produces predictions $\hat{Y_t}$ using previous known Y_{t-1} in contrast to SEIR model which simply produces the entire observed values of $\hat{Y}$ at once.
- Add time varying parameters β_t
- Cross validation rmse could be calculated differently. Get estimates instead for 1-step forecast error, 5-step forecast error, etc. instead of averaging all forecast errors as the 1-step errors will be much lower compared to the 3 week forecast.