Modelling and Analysis of Blood Glucose Measurements

Due to the fact that the original topic and proposal changed due to covid – 19, I am working on data from another PhD student and there is not a main proposal as we have to find one that could be achieved with what we have. There are few main objectives that are described briefly afterwards in the aims that were considered for the data available.

Data:

* 8 individuals that belong to 3 groups:

3 in Control Group (Healthy Individuals)

2 in Prediabetic Group (in between healthy and diabetic)

3 in Diabetic Group

* Time series of glucose measurements with 1728 points on average for each individual (data collected for 6 days and 288 points per 24 hours)
* Data regarding meals during the data collection period: macronutrient composition
* From time series and meal data: 158 glucose peaks were extracted. (67 for control group, 41 for prediabetic and 50 peaks for diabetic group)
* Measurements of metabolic data such as heart rate for one day (12 hours)
* Single Blood glucose measurements for each individual.

AIM of the project:

* Highlight the differences between individuals’ behaviour and the need for individualization.
* Find any relationship between food intakes (macronutrients) and glucose levels
* Model the glucose peaks using nonlinear stochastic model (Using the variational Bayesian model)

Main software:

Matlab and SPSS