

## Timeline of Project Work.

### Michaelmas Term:

- Reading literature, in order to understand the requirements of the project.
- Set up of working environment, including folders, repositories, IDE's etc.
- Discovery of issue of numerical integration, deferred for later consideration.

### Lent Term:

#### First Half:

- Attempting implementation of model fitting with scipy directly. Unsuccessful.
- Attempting a more involved version with ROOT. Unsuccessful.
- Resorting to Numpy and Scipy as the main packages/libraries of choice.

#### Second Half:

- Attempt at a model definition through averaging multiple instances of a lambda/OPD matrix.
- Developed part of the repository, which allows for continuous averaging of observations. Attempted to find a low-RAM solution to the averaging problem. This was via a passed indicator and lazily updating statistical values.
- The values of the standard deviation of the observed matrices were observed to be decreasing at a slowing rate.
- Abandoned Idea since it does not provide a model with the necessary accuracy.

### Lent to Easter Holiday and Easter Term:

- Reverted back to attempting to implement global optimization, this time with a Bayesian Optimization package and scikit-learn Gaussian Regressor.
- Re-investigate the idea of numerical integration, for the purposes of reducing the parameters of the optimization.
- Investigate multiplier effect
- Investigate different models (polynomial, Fourier) via simplified observational techniques
- Use the original repository sparingly as it provides very slow execution
- Investigate possible different parameters  $\nu = 0.5, 1.5, 2.5, \alpha, etc$
- Investigate different size parameter spaces.
- Searching for a model that would fit the requirements. Unsuccessful