

Project Diary of Ben Cookman & Bradly Gadd-Speakman

Project 3/4, Department of Mathematical Sciences, Durham University
2022-23

1 October 5th, 2022 - 11:00-11:40

In this meeting, we reviewed the general plan of the project. We got to know about Brad and Ben's background and interests. We briefly discussed discretisation in time and space and I explained the focus of this project is time integration. I shortly mentioned why parallelisation in time is challenging. Ben and Brad showed interest to pick Julia as the programming language for this project. We decided to use Git/Github as the main platform for sharing files and scripts and collaboration.

Assignment of the week

Brad and Ben will familiarise themselves with Git/Github, review classical time integrators and write scripts that solve simple ODEs using these integrators. Several sources for numerical ODEs (as well as a package for using Git/Github) were shared with them.

2 October 12th, 2022 - 11:00-11:40

Brad and Ben shared their progress during the last week. They had coded Forward Euler and multi-step time integrators and used them to find the numerical solution of a few ODE examples. We talked about Spectral Deferred Correction method briefly and took a look at the paper by Dutt et al. (2000).

Assignment of the week

Brad and Ben will present error and convergence plots in their reports for classical integrator. They will first write a code for a single-step predictor-corrector method. Then, they will read Dutt et al. (2000) and try to implement it.

3 October 19th, 2022 - 11:00-12:00

We went through the beginning of the paper by Dutt et al. (2000) and discussed different aspects of their method. Brad showed the results of his code for Spectral Deferred Correction method.

Assignment of the week

Brad and Ben will develop and cross check their code for Spectral Deferred Correction method. They will test it on a few examples and study the order of convergence.