

An Investigation into Parareal

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Contents

1 Introduction

2 Parareal

3 Implementation

3.1 Naive OpenMP

3.2 Pipelined OpenMP

4 Efficiency Analysis

4.1 Theoretical Results

4.2 Scalability

5 Stability Analysis

With regards to the stability analysis, we aim to try and prove some results on the "stability function" $R(z)$ as seen in Levecue's [?] chapter five through eight and in Staff [?]. We heavily follow the arguments in these sources to derive such results.

Suppose we have the following ordinary differential equation:

$$\begin{cases} u' = \mu u, & \mu < 0, t > 0 \\ u(0) = u_0 \end{cases} \quad (1)$$

We would like to analyze the stability of parareal on this system with a course operator \mathcal{G} and a fine operator \mathcal{F} .