

June 3, 2024

## Certificate of Participation

I certify that

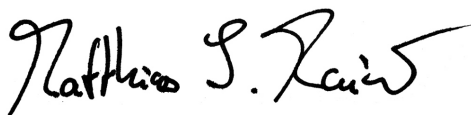
**Joy Chang**

participated in the **Undergraduate Summer School on Modeling and Simulation with Partial Differential Equations**. The summer school was hosted at Texas A&M University from May 20 to May 31, 2024.

The first part of the program consisted of 14h of short courses with 10h of theoretical and practical lab exercises covering a range of topics including: ODEs and time stepping; modeling with PDEs (Reynolds transport theorem, conservation equations, wave equation, diffusion equation); PDE analysis (energy method, method of characteristics, Fourier method); Finite Difference Methods for PDEs (FD approximation of elliptic PDEs, discrete maximum principle, FD schemes for time dependent problems, Crank-Nicolson scheme); the Finite Element Method (weak formulation and weak derivative, stability estimates, implementational aspects). The second part of the summer school was dedicated to 22h of project work including a final presentation.

Joy participated in the project on **Geometric Partial Differential Equations**.

Sincerely,

A handwritten signature in black ink that reads "Matthias S. Maier".

Matthias S. Maier,  
Associate Professor  
Department of Mathematics  
Texas A&M University