SHIYI CHEN

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EDUCATIONS

NYU Shanghai *Intended Graduation: 2023 May*
Major: Honors Mathematics GPA: 3.54/4.00
∘ Courses: Intro to Math Modeling (taking), Honors Calculus, Honors Linear Algebra I, Honors Linear Algebra II, Honors Analysis I, Honors Analysis II(taking), Honors Ordinary Differential Equation(taking), Global Perspective on Society, Writing as Inquiry, English as Academic Purposes, Perspective on Humanity(taking)

Chongqing No.1 High School *2016 Sep - 2019 June*
∘ Second Prize, 33th National Physics Competition for high school students *2017 Nov*
∘ Third Prize, 34th National Mathematics Competition for high school students *2018 Sep*
∘ Second Prize, 2018 Chongqing Mathematics Competition for high school students *2018 April*

EXPLORATIONS

Finding Few Largest Eigenvalues, tutored by Leonardo T. Rolla *2020 Sep - 2020 Oct*
∘ Encode Inverse Power Method and use it in the process of finding few largest eigenvalues of positive real random symmetric square matrices
∘ Propose a searching scheme for finding eigenvalues, the searching scheme succeeded in finding all the 10 largest eigenvalues of 30×30 random symmetric positive matrices in 98.4% sampled randomly
∘ Summarize the finding in a report under GNU Lesser GPL and publish the code on GitHub under CC BY-SA license

An Overview on Linear Solvers, tutored by Leonardo T. Rolla *2020 July - 2020 Aug*
∘ Find optimal linear solver for random symmetric positive matrices
∘ Compare two gradient methods - Steepest Descent (SD) and Conjugate Gradient (CG) with different implementations in the algorithm (different methods for calculating residual, preconditioned or not) by evaluation based on iteration rounds and flops
∘ Propose a linear solver for random symmetric positive matrices, write a self-contained report explaining SD, CG, preconditioning and all the findings, publish code on GitHub

A Flop Count Tool with an Example in PLU Factorization, tutored by Leonardo T. Rolla *2020 June - 2020 July*
∘ Develop a float point operations (flops) counting tool compatible with both MATLAB and GNU Octave which is able to count flops of operations involving variables with changing sizes during execution
∘ Pass the test on the PLU factorization script which the previous tool fails to count the flops
∘ Release the flop count program on GitHub and MATLAB file exchange
∘ Summarize the motivation for tool development, usage and implementations in a report

Visualization of Eigenvalue Problems, tutored by Leonardo T. Rolla *2020 Jan - 2020 Feb*
∘ Use MATLAB plot functions to visualize Jacobi method, Power Method and Gerschgorin disk in the process of finding eigenvalues

PRESENTATIONS

2020 Fall research symposium at NYU Shanghai *2020 Nov 6th*
2020 Spring research symposium at NYU Shanghai *2020 May*