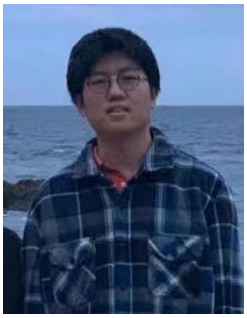
AN XIAODONG, William



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EDUCATION

2018-2022 The Hong Kong Polytechnic University, Hong Kong
Engineering Physics (GPA 3.81) (top 5%)

SOLID STATE PHYSICS (A+)
WAVES (A+)
MATHEMATICS FOR SCIENTISTS AND ENGINEERS (A+)
CALCULUS AND LINEAR ALGEBRA (A+)
UNIVERSITY PHYSICS I (A+)

2019-2020 Exchange: Georgia institute of technology, The United States
(GPA 3.62/4.00)

Electro & Magnetostatics (A)
Quantum Mechanics I (A)
Mathematical Physics (A)

AWARD

2020-2021 • Undergraduate Research and Innovation Scheme (URIS)

2019-2020 • Dean's Honor's List 2019/20

2018-2019 • HKSAR Government Scholarship Fund 2019/20 - Reaching Out Award (ROA)

2018-2019 • Department of Applied Physics Scholarship for Hall Residents 2018/19

RESEARCH EXPERIENCE

Mar 2021- Oct 2021 **Research Experiences For Undergraduates**

Georgia Institute of Technology

Construction of a Visualized Heart-Blood Circulation Model based on FHN function and SPH-Liquid simulation with GPU acceleration

Step One:

Simulating Liquid using Smoothed-Particle Hydrodynamics (SPH) Method

■ **SPH-Liquid Model Construction**

• Included Gravity Force, Pressure Force and Viscosity Force to get acceleration.

• Used the direct search method (could be improved future) to search neighbors in Kernel Function.

• Demonstration: http://xiaodongan.cn/SPH/2021-6-11.html (Open in Google Chrome)

■ **SPH-Liquid Model GPU-acceleration**

• **Improve** the visualization method, with inputting positions of all particles to GPU every time instead of single info of particle. The greatly improved model demonstration: http://xiaodongan.cn/SPH/SPH-9-3.html

Step Two:

Establish the Heart Electromagnetics and Mechanics Model with FitzHugh-Nagumo (FHN) function and Spring-Mass mesh, and then combine them with SPH-Liquid Model

■ **FHN function in GPU code**

• **Construct** the 2D FHN model in GPU code with help of Prof. Flavio. See the demo here: http://xiaodongan.cn/SPH/2021-7-9/FHN2D.html

• **Build** a 50*50 Mesh to represent the Mechanical Heart cells and connecting it with the Electro FHN model. See the demo here: http://xiaodongan.cn/SPH/MESH-9-3.html

- **Combine** the heart model and SPH model together. See the demo in both links: http://xiaodongan.cn/SPH/Model-9-26.mp4;http://xiaodongan.cn/SPH/Model-9-26.html (Mesh model is substituted by Regular Heart Beats due to its often discordance)

Jan- , 2021 **Research Experiences For Undergraduates**

The Hong Kong Polytechnics University

Acceleration of particle dynamics by a particle-swap algorithm in a lattice model of glass

Step One

Comparing relaxation times ($\tau\alpha$) between different simulation algorithms.

■ **Data Processing**

- Use the positions of data ranging from T=0.06 to T=1 to calculate theirs Self-intermediate scattering function (SIF) value, and with a 1/e value, we can get the relaxation times, representing most of the particles have moved.
- Besides the SIF value, overlap q function value is also used to reassure the validity of the results.
- Compare the results with ones of the other MD method.
- Use Autocorrelation Function values to get relaxation time. (Still on-going)

EXTRA-CURRICULAR ACTIVITIES

Aug 2018- Aug 2019 A member in the House of Intercultural Living and Learning (HILL) Program

- Worked on the mental health of the hall students and the held the meeting per week. I was in an inner-program called "HILL intercultural" which was dedicated to intercultural communication and had held an activity called “all black” to try to help the excluded black people.

Oct 2020- Aug 2021 A mentee in the INSPIRE mentorship program

- Mentored by Mr. Jimmy Kwok Chun-Wah, SBS, MH, JP

Jun 2021- Aug 2021 Georgia Institute of Technology REU physics summer camp (online).

ACADEMIC PROJECTS

Dec 2018- Jan 2019 Physics Club Project-“Line Tracking Car using Arduino”

- Used the Infrared sensors and several motors controlling boards to make sure the car walking along the black line.