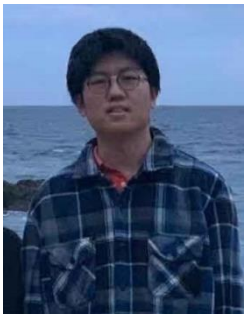
AN XIAODONG, William



Email: xiao-dong.an@connect.polyu.hk **Phone number:** +852 93610675

xan37@gatech.edu **Personal website:** XiaodongAn.cn

Address: The Hong Kong Polytechnic University Homantin Hall 0631d

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

2021-2022 • HKSAR Government Scholarship 2021/22 (80000 HKD)
2020-2021 • College of Undergraduate Researchers and Innovators (CURI) Scholar (10000 HKD)
2019-2020 • Dean's Honor's List 2019/20, 2020/21
2018-2019 • HKSAR Government Scholarship Fund 2019/20 - Reaching Out Award (10000 HKD)
2018-2019 • Department of Applied Physics Scholarship for Hall Residents 2018/19 (5000 HKD)

PUBLICATION

2021 • Diffusion coefficient power laws and defect-driven glassy dynamics in swap acceleration, Gautham Gopinath, Chun-Shing Lee, Xin-Yuan Gao, **Xiao-Dong An**, Chor-Hoi Chan, Cho-Tung Yip, Hai-Yao Deng, and Chi-Hang Lam (arXiv:2111.11697) (in submission)

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:

Simulate 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:

Compare relaxation times ($\tau\alpha$) between particle-swap algorithm and void-hopping algorithm

■ **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. See the explanation of particle-swap algo here: http://xiaodongan.cn/DPLM/Global_Swap_Algo.pdf
- Compare $\tau\alpha$ with ones of the other MD method, where there is a clear speed-up at low temperatures See the result at here: http://xiaodongan.cn/DPLM/2021-6-30.pdf

Step Two:

Obtain relaxation times ($\tau\alpha$) in different methods other than SIF

- Besides the SIF value, overlap_q Function and Autocorrelation Function value are also used to reassure the validity of the results. See the definition of these two algos here: http://xiaodongan.cn/DPLM/overlap_q.pdf (IV);http://xiaodongan.cn/DPLM/ACF.pdf

EXTRA-CURRICULAR ACTIVITY

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 PROJECT

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.