

Lufter C.W. Liu

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Education

National Cheng Kung University (NCKU)

Tainan, Taiwan

B.S. IN CIVIL ENGINEERING

06/2020

- Overall GPA: 3.55/4.3, Physics Major: 4.16/4.3
- Courses: Physcis (QM I&II, EM I&II, SS), Engineering, Material Science, Computational Science

Research Experience

Research Assistant , Physics Dept. Matterwave Lab, Prof. Pei Chen Kuan

Tainan, Taiwan

MULTIPLE WAY QUANTUM WALK

08/2019 - Present

- Discussed potential phenomenon when implementing multiple way quantum walk (MWQW) in optical systems.
- Investigated the flaws in previous asymptotic analysis methods.
- Evaluated the performance of MWQW with embeded parameters in the W operator both analytically and numerically.

Research Assistant, Civil Engineering Dept. AI Material Lab, Prof. Yun Che Wang

Tainan, Taiwan

MACHINE LEARNING IN HDHS MATERIAL DESIGN [APCOM2019], [CTAM2020]

02/2019 - 06/2020

- Applied various generative adversarial networks (GANs) to generate high fidelity material samples.
- Proposed a method using VGG networks that can predict mechanical properties from microstructure images with 95% accuracy.
- Investigated an integrated model that optimizes the geometry generated by GANs.

ALGORITHMS FOR CONSTRUCTING AUXETIC MATERIALS GEOMETRY.

- Applied prunning protocol to generate auxetic networks based on "Auxetic metamaterials from disordered networks".
- Proposed a prunning protocol that ran on 96 cloud-based CPUs, incresed the computatioinal efficiency by 40 times.
- Implemented a stochastic protocol to produce large scale homogenous microstructure datasets by two-point correlation function.

Publication

1. **Chun Wei Liu**, Pei Chen Kuan, *Symmetric Quantum Walk With Phase Transition Feature*, Physics Prview Meow, 2020 (In preperation)
2. Yun-Che Wang, **Chun Wei Liu** , Pei-Chen Cheng , Jyun-Ping Wang, Tsai-Wen Ko, *Design of Chiral Metamaterials via Deep Neural Networks*, 44th National Conference on Theoretical and Applied Mechanics (CTAM2020)

Honors & Awards

- 2020 **Chairman Special Award (entering final round)**, IBMq Qiskit Hackthon Taiwan
- 2018 **5th Place (out of 250 students)**, Asia Pacific Mechanics Contest for College Students
- 2016 **Dean's list** , GPA in top 5% of the department

Presentation

Design of Viscoelastic Auxetic Materials Through Machine Deep Learning [\[Link\]](#)

Taipei, Taiwan

ASIAN PACIFIC CONGRESSON COMPUTATIONAL MECHANICS (APCOM2019)

12/2019

- Discussed the use of VGG networks as an alternative of finite element method when labeling mechanical properties of small scale 2D microstructure geometries.

Selected Projects

Predicting Handwriting Recognition With Parametrized Quantum Circuit

FOR IBMQ QISKIT HACKTHON TAIWAN 2020

09/2020

- Implemented 4qubit-Ry gate circuits in predicting MNIST dataset with learning curve converge after 2 iteration.
- Analized the potential in predicting molecular ground state energies with Quantum LSTM Meta-Learner.

Extracurricular Activity

NCKU CE Student Association

Tainan, Taiwan

ACADEMIC DIRECTOR

06/2017 - 06/2018

- Organized several construction site-visiting through contacting mojour consulting corporations for 200 students accumulated.

American Language Program, School of Professional Studies, Columbia University

New York City, NY

STUDENT

07/2018 - 08/2018

- Passed the intensive C1 english program and visited some advanced academic facilities.

Skills

Languages: Python, C/C++, MATLAB **Libraries/Tools:** Qiskits, Tensorflow, PyTorch **Other Technologies:** GNU/Linux, Raspberry Pi, GCP, Git, LAMMPS, \LaTeX