# Chun-Wei Liu

e64069094@gs.ncku.edu.tw | lufter.github.io | Lufter

## Research Interests

Quantum Information, Quantum Computing, Computational Physics.

## Education

**National Cheng Kung University** *Tainan, Taiwan*

B.S. in Civil Engineering *06/2020*

- Overall GPA: 3.55/4.3, Physics Major: 4.16/4.3

## Research Experience

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

Semi Quantum Walk *08/2019 - PRESENT*

- Discussed a generalized quantum walk with a parameterized shift operator that can improve high precision measurement of quantum states adapting optical methods.
- Proposed a numerical simulation model of quantum walks.

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

Machine learning in material design. *02/2019 - PRESENT*

- Applied various generative adversarial networks(GANs) to generate high fedility 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.

Constructing auxetic materials unsing computational molecular dynamics.

- Prunned auxetic networks to generate material with negtive poisson's ratio based on "**Auxetic metamaterials from disordered networks**".
- Proposed a model that dealt with 96-core processors, incresed the computatioinal efficiency by 40 times.

## Publications

1. **Chun Wei Liu,** Pei Chen Kuan, *"Symmetric quantum walk with phase transition feature"*(Under peer revison.)
2. Yun-Che Wang**, Chun Wei Liu** , Pei-Chen Cheng , Jyun-Ping Wang, Tsai-Wen Ko, *"Design of Chiral Metamaterials via Deep Neural Networks"*(Under peer revison.)

## Honors & Awards

2018 **5th Place**, Asia Pacific Mechanics Contest for College Students

2020 **Chairman Special Award**, "Hybrid Neural Networks with VQE", IBMq Qiskit Hackthon Taiwan

## Presentation

**Asian Pacific Congresson Computational Mechanics (APCOM2019)** *Taipei, Taiwan*

Presenter for *"Design of Viscoelastic Auxetic Materials Through Machine Deep Learning"* *12/2019*

- Application of VGG networks when labeling microtructure images.

## Extracurricular Activity

**Academic Department of NCKU CE Student Association** *Tainan, Taiwan*

Director *06/2017 - 06/2018*

- Organized several construction site-visiting including, hydraulic systems, metro transtortation sysytems and mojor consulting corporations.
- Held workshops and talks for student fellows and prospective junior students.

**American Language Program, School of Professional Studies, Columbia University** *New York City, NY*

Student *07/2018 - 08/2018*

- Visited an advance academic facility and preparing my prospected academic studies in the U.S.

## Skills

**Natural Languages** Mandarin, Taiwanese, English, German, Russian
**Programming Languages**Python, C/C++, MATLAB
**Deep Learning Libraries** Tensorflow, PyTorch, Keras
**Other Technologies** Qiskits, Linux, AWS, Google Cloud Service, Git, LAMMPS, LaTeX