

Chun-Wei Liu

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Research Interests

Quantum Information, Quantum Computing, Computational Physics.

Education

National Cheng Kung University

B.S. IN CIVIL ENGINEERING

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

Tainan, Taiwan

06/2020

Research Experience

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

SEMI QUANTUM WALK

- 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.

Tainan, Taiwan

08/2019 - PRESENT

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

MACHINE LEARNING IN MATERIAL DESIGN.

- 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.

Tainan, Taiwan

02/2019 - PRESENT

CONSTRUCTING AUXETIC MATERIALS USING COMPUTATIONAL MOLECULAR DYNAMICS.

- Pruned auxetic networks to generate material with negative poisson's ratio based on "Auxetic metamaterials from disordered networks".
- Proposed a model that dealt with 96-core processors, increased the computational efficiency by 40 times.

Publications

1. **Chun Wei Liu**, Pei Chen Kuan, "Symmetric quantum walk with phase transition feature"(Under peer revision.)
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 revision.)

Honors & Awards

- 2018 **5th Place**, Asia Pacific Mechanics Contest for College Students
- 2020 **Chairman Special Award**, "Hybrid Neural Networks with VQE", IBM Q Qiskit Hackthon Taiwan

Presentation

Asian Pacific Congresson Computational Mechanics (APCOM2019)

PRESENTER FOR "Design of Viscoelastic Auxetic Materials Through Machine Deep Learning"

- Application of VGG networks when labeling microstructure images.

Taipei, Taiwan

12/2019

Extracurricular Activity

Academic Department of NCKU CE Student Association

DIRECTOR

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

Tainan, Taiwan

06/2017 - 06/2018

American Language Program, School of Professional Studies, Columbia University

STUDENT

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

New York City, NY

07/2018 - 08/2018

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