BO-YU CHEN

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EDUCATION

National Taiwan University Taipei, Taiwan
Bachelor of Science in Physics | GPA: 4.15/4.30 (Overall/Scale) Sep 2023 - present

- National Taiwan University Fu Bell Scholarship (Highest distinction, Top 1 % students across university)
- 1st place in the undergraduate special talent admission

Affiliated Senior High School of National Taiwan Normal University Taipei, Taiwan
Computer Science Honor Program | GPA: 100/98/100 (Math/Physics/Scale) Aug 2020 - Jun 2023

- Taipei City Mayor Award (Highest distinction, Top 1% graduates)
- 1st place in the entrance exam

RESEARCH INTERESTS

Statistical machine learning, 2D materials.

PUBLICATIONS

⋆Equal contribution.

[5] STanHop: Sparse Tandem Hopfield Model for Memory-Enhanced Time Series Prediction,
Dennis Wu⋆, Jerry Yao-Chieh Hu⋆, Weijian Li⋆, **Bo-Yu Chen**, Han Liu,
In *12th International Conference on Learning Representations (ICLR'24)*, 2024. arXiv:2312.17346

[4] Magnetoresistance Properties in Nickel-catalyzed, Air-stable, Uniform, and Transfer-free Graphene,
Bo-Yu Chen, Bo-Wei Chen, Wu-Yih Uen, Chi Chen, Chiashain Chuang, Dung-Sheng Tsai,
Accepted to Nanotechnology, 2024. DOI: 10.1088/1361-6528/ad2381

[3] On Sparse Modern Hopfield Model,
Jerry Yao-Chieh Hu, Donglin Yang, Dennis Wu, Chenwei Xu, **Bo-Yu Chen**, Han Liu,
In *37th Conference on Neural Information Processing Systems (NeurIPS'23)*, 2023. arXiv:2309.12673
This work was highlighted in *Northwestern CS department news*.

[2] Modulations for Quantum Electronic Material Transports by Vacuum Annealing Methods,
Ji-Wei Ci, **Bo-Yu Chen**, Yuan-Chih Hung, Huan-Chien Wang, Dung-Sheng Tsai, Wu-Yih Uen, Yuan-Liang Zhong, Jhy-Shyang Wang, Chi-Te Liang, Chiashain Chuang,
Spin, 2340023, 2023. DOI: 10.1142/S2010324723400234

[1] First-Principles Study on Possible Half-Metallic Ferrimagnetism in Double Perovskites $Pb_2XX'O_6$ (X = Ti, Zr, Hf, V, Nb and Ta, X' = Tc, Ru, Os and Rh),
Bo-Yu Chen, Po-Han Lee, Yin-Kuo Wang,
Materials **15**, 3311, 2022. DOI: 10.3390/ma15093311

HONORS

- **Fu Bell Scholarship** (Highest distinction, Top 1% students across university), NTU, Taiwan 2023
- **Taipei City Mayor Award** (Top 1% high school graduates), Taipei City, Taiwan 2023
- **Sakura Science Exchange Program** (official invitation), Japan Science and Technology Agency, Japan 2023

RESEARCH EXPERIENCES

Department of Computer Science, Northwestern University Evanston, IL (Remote)
Computational and Statistical Theory of Ising Model in Machine Learning Jan 2023 - present

- Undergraduate research, with Prof. Han Liu

- Introduced STanHop-Net, a time series prediction model, combines a Hopfield-based block with external memory modules, enhancing learning, rapid response to rare events, and superior empirical performance. [5]
- Introduced a sparse modern Hopfield model with memory-retrieval dynamics connecting to the sparse-structured attention, enabling robust representation learning, fast convergence, and exponential memory capacity. [3]

Department of Electronics Engineering, Chung Yuan Christian University Taoyuan, Taiwan
Two-Dimensional Materials and Nanoscale Electronic Devices Aug 2021 - Jun 2023

- Independent research, with Prof. Chiashain Chuang and Prof. Dung-Sheng Tsai
- Synthesized transfer-free graphene by atmospheric-pressure chemical vapour deposition (APCVD) and investigated its magnetoresistance mechanism for potential applications in nanoscale magentic sensor. [4]
- Investigated the quantum electronic material transports by vacuum annealing methods. [2]

National Taiwan Normal University Taipei, Taiwan
Density Functional Theory and First Principle Calculation Oct 2021 - May 2022

- Independent research, with Prof. Po-Han Lee and Prof. Yin-Kuo Wang
- Investigated the half-metallic and ferromagnetic properties of Pb-based double perovskite by Vienna Ab initio Simulation Package (VASP). [1]

CONFERENCES PRESENTATIONS

[3] Temperature-Dependent Magnetoresistance of Transfer-Free Graphene Grown by APCVD,
Bo-Yu Chen, Bo-Wei Chen, Ji-Wei Ci, Wu-Yih Uen, Po-Han Lee, Chi Chen, Chiashain Chuang, Dung-Sheng Tsai,
13th Recent Progress in Graphene and Two-dimensional Materials Research Conference, Taipei, Taiwan, November 2022

[2] Ab initio study on the growth mechanism of graphene on metal,
Bo-Yu Chen, Po-Han Lee, Yin-Kuo Wang,
2022 Annual Meeting of the Physical Society of Taiwan, Taipei, Taiwan, January 2022

[1] Layer-dependent properties of $SnSe_2$ two dimensional materials,
Bo-Yu Chen, Po-Han Lee, Yin-Kuo Wang,
2022 Annual Meeting of the Physical Society of Taiwan, Taipei, Taiwan, January 2022