Boyuan Yu

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Education

PhD degree in Civil Engineering *McGill University*
PhD degree program *September 2020 - October 2024*
CGPA: 4.00/4.00.
Thesis title: Modelling and Simulation of Extreme Waves in Fast Floods.

Master's degree in Civil Engineering *McGill University*
Master's degree program *September 2018 - May 2020*
CGPA: 3.96/4.00.
Thesis title: Transverse shear instability in steep open-channel flow, Link.

Bachelor's degree in Water Conservancy and Hydropower Engineering *Hohai University*
Bachelor's degree program *September 2014 - May 2018*
CGPA: 4.80/5.00.
Ranking: 1/155.

Citizenship Status

People's Republic of China

Peer-Reviewed Publications

1. **Boyuan Yu**, and Vincent H. Chu,
The front runner in roll waves produced by local disturbances,
Journal of Fluid Mechanics, 932, A42 (2022) [18 pages];
DOI: 10.1017/jfm.2021.1011.

2. **Boyuan Yu**, and Vincent H. Chu,
Impact force of roll waves against obstacles,
Journal of Fluid Mechanics, 969, A31 (2023) [25 pages];
DOI: 10.1017/jfm.2023.580.

3. **Boyuan Yu**, and Vincent H. Chu,
Roll Waves in Mudflow Modelled as Herschel-Bulkley Fluids,
Journal of Engineering Mechanics, (2024) [17 pages];
DOI: 10.1061/JENMDT/EMENG-7931.

4. **Boyuan Yu**, and Vincent H. Chu,
Roll Waves on a Laminar Sheet Flow of Newtonian Fluid with Negligible Surface Tension,
Journal of Fluid Mechanics, 999, A49 , (2024) [31 pages];
DOI: 10.1017/jfm.2024.887.

5. **Boyuan Yu**, and Vincent H. Chu,
Direct Numerical Simulation of Roll Waves on Landslide Mudflow,
Physics of Fluids (2024) [24 two-column manuscript pages];
DOI: 10.1063/5.0239285

6. **Boyuan Yu**
Improved prediction of the front runner in roll waves produced by localized disturbance,
Accepted by Wave Motion (2024) [in press, 32 pages in manuscript].

7. **Boyuan Yu**, and Vincent H. Chu,
   Roll waves in two-layer xxx xxx,
   In preparation.

8. **Boyuan Yu**, and Vincent H. Chu,
   Wave and bed-friction effect on instability of shear flow in shallow waters,
   the 10th Conference on Fluvial Hydraulics - River Flow 2020: Delft, Netherlands [8 pages];
   DOI: 10.1201/b22619-12.

9. **Boyuan Yu**, and Vincent H. Chu,
   Impact force of the roll waves produced by local disturbances,
   the 39th IAHR World Congress (2022): Granada, Spain [10 pages];
   DOI: 10.3850/IAHR-39WC2521711920221273.

10. **Boyuan Yu**, and Vincent H. Chu,
    Roll Waves on a Laminar Sheet Flow produced by Local Disturbance,
    the 11th International Conference on Fluvial Hydraulics - River Flow 2022: Kingston and Ottawa, Canada [8 pages].

11. **Boyuan Yu**, and Vincent H. Chu,
    Impact of Mud Flow Instabilities on Hydraulic Structures,
    the 11th International Conference on Fluvial Hydraulics - River Flow 2022: Kingston and Ottawa, Canada [9 pages].

12. **Boyuan Yu**, and Vincent H. Chu,
    The Impact of Flood Waves on Hydraulic Structures,
    the 11th International Conference on Fluvial Hydraulics - River Flow 2022: Kingston and Ottawa, Canada [8 pages].

13. **Boyuan Yu**, and Vincent H. Chu,
    The Front Runner of Roll Wave in Mudflow,
    Accpted by Proceedings of the ASME 2024 43nd International Conference on Ocean, Offshore and Arctic Engineering OMAE2024: Singapore [10 pages].

14. **Boyuan Yu**, and Vincent H. Chu,
    Impact of Roll Waves in Mudflow on Hydraulic Structures,
    Accpted by Proceedings of the ASME 2024 43nd International Conference on Ocean, Offshore and Arctic Engineering OMAE2024: Singapore [10 pages].

15. **Boyuan Yu**, and Vincent H. Chu,
    The Front Runner of Roll Waves in Jiang-Jia Ravine,
    Accpted by the 10th International Symposium on Hydraulic Structures 2024: Zurich, Switzerland [9 pages, withdrew due to visa reasons].

16. **Boyuan Yu**, and Vincent H. Chu,
    Roll Waves on Landslide Mudflow against Structures of Various Shapes and Orientations,
    Accpted by the 10th International Symposium on Hydraulic Structures 2024: Zurich, Switzerland [10 pages, withdrew due to visa reasons].

Talks and Presentations

1. **Boyuan Yu**, and Vincent H. Chu,
   The video animation related to the conference paper *Impact of Mud Flow Instabilities on Hydraulic Structures*,
   River Flow 2022 Conference Best Video Contest, 2022.

2. **Boyuan Yu**,
   Modelling and Simulation of Roll Waves Using Basilisk and Gerris, Link,
   Basilisk Monthly Meeting, October 29th, 2024.

Awards

1. **Boyuan Yu**,
   National Scholarship by the Ministry of Education of the PRC (top 1% of the undergraduate students every year), 2015.
2. **Boyuan Yu**,
   Excellent Graduate Student Award by Hohai University (top 5% of the graduate student), 2018.
3. **Boyuan Yu**,
   Grad Excellence Award in Civil Engineering & Applied Mechanics by McGill University, 2019.
4. **Boyuan Yu**,
   MEDA (McGill Engineering Doctoral Award) scholarship by McGill University, 2020.
5. **Boyuan Yu**, and Vincent H. Chu,
   OMAE2024 Best Paper Award for conference paper OMAE2024-121514, 2024.

Teaching and Mentoring

Teaching Assistant *September 2019 - May 2024*
McGill University *Montreal, Canada*

- CIVE 281: Analytical Mechanics.
- CIVE 327: Fluid Mechanics and Hydraulics.
- CIVE 572: Computational Hydraulics.

Research Interests

- Hydrodynamic instabilities.
- Shallow water equations.
- Hyperbolic conservation laws.
- Finite volume method.
- Riemann solvers.
- Roll waves and shear instabilities.
- Multiphase flow.
- Non-Newtonian fluids.
  - Visco-plastic fluids.
  - Visco-elastic fluids.
  - Granular flow.
- Wave impact forces on structures.
- Open-source CFD.
- Multilayer model.
- Spectral method.

- Stratified flow, density currents, internal waves.

Technical Skills

Programming Languages/Tools	Matlab, Mathematica, Python, C, Fortran, Julia
Numerical models for CFD	Basilisk, Gerris, OpenFOAM, Clawpack, Centpy, Wavemaker
Postprocessing tools for CFD	Tecplot, Paraview, OriginLab, Microsoft Visio, Gnuplot
Text processing	LaTeX, Microsoft Word, Markdown & Obsidian
Operating system	Windows, Linux
Video editing	Kdenlive
Languages	Mandarin (mother tongue), English (proficient), Italian (elementary), Cantonese (beginner), French (beginner)