Duy Hai VO, Ph.D.

Postdoctoral Researcher position

Department of Materials Science and Engineering, Missouri University of Science and Technology
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EDUCATION:

Ph.D.	National Taiwan University of Science and Technology (NTUST), Taipei city, Taiwan (International program) Major in Construction Materials *Thesis:* "The study of the effect of MgO on the performance and microstructure of alkali-activated slag paste and mortar with recycled fine aggregate." *Thesis Advisors:* Professor Chao-Lung Hwang	2016/02-2019/05
M.S.	University of Technology – The University of Danang (DUT), Danang, VietNam Major in Structural Engineering *Thesis: "*A research in the impact of cracks in concrete which has incomplete interaction with figured steel beam on the load capacity of composite steel and concrete beam." *Thesis Advisor:* Dr. Minh-Son Huynh	2012/09-2015/02
B.S.	Ho Chi Minh City University of Technology, Ho Chi Minh city, Vietnam Major in Civil and Construction Engineering	2006/09-2011/01

RESEARCH INTERESTS:

- Advanced characterization techniques in the field of cementitious materials (e.g., TGA, XRD, SEM-BSE-EDS, FTIR)
- Cement chemistry (e.g., hydration heat characteristics, pore solution extraction)
- Green concrete, high-performance concrete with sustainable development through using recycled aggregates (i.e., recycled concrete aggregate, quarry fines, steel slag aggregates, mine tailing) and high volume supplementary cementitious materials (i.e., fly ash, ground granulated blast furnace slag)
- Green binder materials based on alkali-activated materials, cementless materials
- CO_2 capture

RESEARCH EXPERIENCE:

Postdoctoral Researcher **2025/01-present**

Department of Materials Science and Engineering, Missouri University of Science and Technology
Advisor: **Professor Aditya Kumar**

- Contribute to large-scale proposal writing and engage in interdisciplinary research
- Reuse and recycle the waste clay to become a reactivity powder in construction materials
- Use the heat treatment to improve the reactivity of waste clay
- Investigate the reactivity of calcined clay through calorimetric test, strength activity index
- Investigate the microstructure and hydration products of cement concrete, including calcined clays

Postdoctoral Researcher **2019/06-2024/02**

Department of Civil and Construction Engineering, National Taiwan University of Science and Technology

Advisor: **Professor Chao-Lung Hwang (2019/06-2020/02)**

1. HORIZON 2020 (H2020-EEB-2016)- REuse and REcycling of construction demolition waste (CDW) materials and structures in energy-efficient pREfabricated elements for building REfurbishment and construction (RE4)
    - Studied the method for blending recycled aggregate and natural aggregate to produce the high-performance concrete
    - Tested the mechanical properties and durability of concrete samples
    - Tested the microstructure of concrete samples
    - Produce the green binder from recycling construction demolished waste
    - Studied the fresh properties, mechanical properties and microstructure of binder materials
2. Development of new green binders for different industrial waste materials
    - Developed different cementless binders using industrial by-products (i.e., rice husk ash, circulating fluidized bed combustion fly ash, ground granulated blast furnace slag)
    - Tested the mechanical properties, durability and microstructure of mortar samples using green binder

Advisor: **Professor Min-Chih Liao (2020/03-2024/02)**

1. Design with Flexible Pavement Performance of Warm Mix Asphalt Based on Densified Mixture Design Methodology
    - Studied the apply densified mixture design algorithm for asphalt concrete mixture
2. HORIZON 2020 (H2020-LC-GD-2020)-No.101036926- A Holistic Fire Management Ecosystem for Prevention, Detection and Restoration of Environmental Disasters (DRYADS)
    - Prepare research proposal for Taiwan Team
    - Recycled wood bottom ash from a timber factory to produce green binder based on alkali-activated materials
    - Tested fire resistance and thermally induced properties of green binder developed by wood bottom ash

TEACHING EXPERIENCE:

Lecturer 2012/12-present

Course: Construction machines; Safety in Construction Activities, Construction materials
Department of Civil Engineering, The University of Danang-University of Technology and Education, Danang city, Vietnam

AWARDS, AND HONORS:

Honorary Membership, The Phi Tau Phi Scholastic Honor Society of the Republic of China 2019/06-present

PROFESSIONAL SERVICE:

Manuscript Reviewer
Journal of Materials in Civil Engineering, ASCE
Construction and Building Materials. CBM

EXTRA ACTIVITIES:

Vietnamese Student Association at National Taiwan University of Science and Technology
Vice President 2017-2018

Vietnam Innovative and Intellectual Network in Taiwan
Section head 2021-03/2024

JOURNAL PUBLICATIONS: here

1. Vu-An Tran, Hoang-Anh Nguyen, Le Anh Tuan Bui, **Duy-Hai Vo** (2024). Synergistic effects of limestone powder and unground rice husk ash additions on performances of slag-cement based

self-compacting concrete. Materials and Structures 57(4), 79 (SCIE-Q1).

2. Behailu Zerihun Hailemariam, Mitiku Damtie Yehualaw, Woubishet Zewdu Taffese, **Duy-Hai Vo** (2024). Optimizing Alkali-Activated Mortars with Steel Slag and Eggshell Powder. Buildings, 14 (8), 2336 (SCIE-Q2).

3. **Duy-Hai Vo**, Vinh-Phuc Doan, Huu-May Nguyen, Tan-Khoa Nguyen (2024). Evaluation the long-term performance of high-performance concrete produced with blended river sand/sea sand and high volume GGBFS. Journal of Material Cycles and Waste Management, 1-20 (SCIE-Q2).

4. Yibas Mamuye, Min-Chih Liao, Ngoc-Duy Do, **Duy-Hai Vo** (2024). Performance of Cold-Mix Asphalt with Calcined Eggshell Powder–Activated GGBFS Filler. Journal of Materials in Civil Engineering 36 (4), 04024003 (SCIE-Q1).

5. Min-Chih Liao, **Duy-Hai Vo*,** Ngoc-Duy Do, Quoc-Thien Tran, Hoang-Anh Nguyen (2024). Strength development, length change performance and microstructure of alkali-activated slag paste modified with various fly ash and magnesium oxide content. Construction and Building Materials 421, 135600 (SCIE-Q1).

6. Ngoc-Duy Do, Min-Chih Liao, Yibas Mamuye, **Duy-Hai Vo** (2024). Evaluating Influences of Alkali-Activated Slag Filler on the Engineering Properties of Asphalt Concrete Using Monotonic Indirect Tensile Tests. Journal of Materials in Civil Engineering 36 (2), 04023557 (SCIE-Q1).

7. **Duy-Hai Vo,** Ngoc-Duy Do, Yibas Mamuye, Chao-Lung Hwang, Min-Chih Liao, Mitiku Damtie Yehualaw, Chiang Pin Kuo (2023). Evaluating the Performance of Early-Age Fly Ash Concrete Subjected to Steam and Autoclave Heat Treatments. Journal of Materials in Civil Engineering 35 (12), 04023455 (SCIE-Q1).

8. Khanh-Dung Tran Thi, Min-Chih Liao, **Duy-Hai Vo** (2023). The characteristics of alkali-activated slag-fly ash incorporating the high volume wood bottom ash: Mechanical properties and microstructures. Construction and Building Materials 394, 132240 (SCIE-Q1).

9. **Duy-Hai Vo,** Minh-Hieu Nguyen, May Huu Nguyen, Chao-Lung Hwang, Trong-Phuoc Huynh (2023). Influence of rice husk ash and hybrid fiber on engineering properties of densified high-performance fiber-reinforced concrete. Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications 237 (11) 1-13 (SCIE-Q2).

10. **Duy-Hai Vo**, Khanh-Dung Tran Thi, Yibas Mamuye, Ngoc-Duy Do, Min-Chih Liao, Chao-Lung Hwang (2023). Engineering properties and stability of high-performance mortar incorporating untreated and treated steel reducing slag aggregate. Journal of Building Engineering 67, 105992 (SCIE-Q1).

11. **Duy-Hai Vo**, Khanh-Dung Tran Thi, Chao-Lung Hwang, Min-Chih Liao, Wei-Liang Hsu, Mitiku Damtie Yehualaw (2023). Mechanical properties of concrete produced with alkali-activated slag-fly ash and recycled concrete aggregate and designed using the densified mixture design algorithm (DMDA) method: Effects of recycled aggregate content and alkaline solution. Developments in the Built Environment 14, 100125 (SCIE-Q1).

12. **Duy-Hai Vo,** Chao-Lung Hwang, Khanh-Dung Tran Thi, Mitiku Damtie Yehualaw, Min-Chih Liao, Hser Te Yu (2022). Effect of polymer latex on the efflorescence, drying shrinkage and microstructure of alkali-activated slag paste. Journal of Sustainable Cement-Based Materials 12 (4), 460-470 (SCIE-Q1).

13. **Duy-Hai Vo,** Chao-Lung Hwang, Khanh-Dung Tran Thi, Mitiku Damtie Yehualaw, Min-Chih Liao, Yun-Tai Lee (2022 Utilization of high-volume mine tailing and by-products in composite binder production: hardened properties and sustainable development. Journal of Material Cycles and Waste Management 24 (4), 1267-1280 (SCIE-Q2).

14. **Duy-Hai Vo,** Chao-Lung Hwang, Trong-Phuoc Huynh (2022). Performance evaluation of a green mortar developed from a ternary eco-cement of industrial solid wastes. Advances in Cement Research 34 (6), 245-259 (SCIE-Q2).

15. **Duy-Hai Vo,** Ngoc-Duy Do, Yibas Mamuye, Min-Chih Liao, Chao-Lung Hwang, Quoc-Thien Tran (2022). Engineering properties and durability of concrete samples designed by densified mixture

design algorithm (DMDA) method incorporating steel reducing slag aggregate. Construction and Building Materials 354, 129180 (SCIE-Q1).

16. Solomon Asrat Endale, Woubishet Zewdu Taffese, **Duy-Hai Vo**, Mitiku Damtie Yehualaw (2022). Rice husk ash in concrete. Sustainability 15 (1), 137 (SCIE-Q2).
17. Mitiku Damtie Yehualaw, Mihiret Alemu, Behailu Zerihun Hailemariam, **Duy-Hai Vo**, Woubishet Zewdu Taffese (2022). Aquatic weed for concrete sustainability. Sustainability 14 (23), 15501 (SCIE-Q2).
18. **Duy-Hai Vo**, Ngoc-Duy Do, Chao-Lung Hwang, Min-Chih Liao, Chien-Ming Lu (2022). The application of steel slag aggregate for concrete pavement: mechanical properties and stability. Journal of the Chinese Institute of Civil and Hydraulic Engineering 34(8), 739-748. (Scopus)
19. Behailu Zerihun, Mitiku Damtie Yehualaw, **Duy-Hai Vo** (2022). Effect of agricultural crop wastes as partial replacement of cement in concrete production. Advances in Civil Engineering 2022. (SCIE-Q3)
20. Vu-An Tran, Chao-Lung Hwang**, Duy-Hai Vo** (2021). Manufacture and Engineering Properties of Cementitious Mortar Incorporating Unground Rice Husk Ash as Fine Aggregate. Journal of Materials in Civil Engineering 33 (10), 04021258 (SCIE-Q1).
21. **Duy-Hai Vo**, Chao-Lung Hwang, Khanh-Dung Tran Thi, Min-Chih Liao, Mitiku Damtie Yehualaw (2021). Engineering performance of high-content MgO-Alkali-activated slag mortar incorporating fine recycled concrete aggregate and fly ash. Journal of Material Cycles and Waste Management 23: 778-789 (SCIE-Q2).
22. Mitiku Damtie Yehualaw, Chao-Lung Hwang, **Duy-Hai Vo**, Abraham Koyenga (2021). Effect of alkali activator concentration on waste brick powder-based ecofriendly mortar cured at ambient temperature. Journal of Material Cycles and Waste Management 23: 727-740 (SCIE-Q2).
23. **Duy-Hai Vo,** Mitiku Damtie Yehualaw, Chao-Lung Hwang, Min-Chih Liao, Khanh-Dung Tran Thi, Yu-Fan Chao (2021). Mechanical and durability properties of recycled aggregate concrete produced from recycled and natural aggregate blended based on the Densified Mixture Design Algorithm method. Journal of Building Engineering 35: 102067 (SCIE-Q1).
24. **Duy-Hai Vo,** Chao-Lung Hwang, Khanh-Dung Tran Thi, Mitiku Damtie Yehualaw, Min-Chih Liao, Yu-Fan Chao (2021). HPC produced with CDW as a partial replacement for fine and coarse aggregates using the Densified Mixture Design Algorithm (DMDA) method: Mechanical properties and stability in development. Construction and Building Materials 270: 2021 (SCIE-Q1).
25. **Duy-Hai Vo,** Chao-Lung Hwang, Mitiku Damtie Yehualaw, Min-Chih Liao (2021). The influence of MgO addition on the performance of alkali-activated materials with slag−rice husk ash blending. Journal of Building Engineering 33: 101605 (SCIE-Q1).
26. **Duy-Hai Vo**, Chao-Lung Hwang, Khanh-Dung Tran Thi, Mitiku Damtie Yehualaw, Wei-Chih Chen (2020). Effect of Fly Ash and Reactive MgO on the Engineering Properties and Durability of High-Performance Concrete Produced with Alkali-Activated Slag and Recycled Aggregate. Journal of Materials in Civil Engineering 32 (SCIE-Q1).
27. Chao-Lung Hwang, **Duy-Hai Vo**, Trong-Phuoc Huynh (2020). Physical–microstructural evaluation and sulfate resistance of no-cement mortar developed from a ternary binder of industrial by-products. Environmental Progress & Sustainable Energy 13421 (SCIE-Q2).
28. Chao-Lung Hwang, Mitiku DamtieYehualaw, **Duy-Hai Vo**, Trong-Phuoc Huynh, Alessandro Largo (2019). Performance evaluation of alkali-activated mortar containing high volume of waste brick powder blended with ground granulated blast furnace slag cured at ambient temperature. Construction and Building Materials 223: 657-667 (SCIE-Q1).
29. Chao-Lung Hwang, Mitiku DamtieYehualaw, **Duy-Hai Vo**, Trong-Phuoc Huynh (2019). Development of high-strength alkali-activated pastes containing high volumes of waste brick and ceramic powders. Construction and Building Materials 218: 519-529 (SCIE-Q1).

30. Chao-Lung Hwang, **Duy-Hai Vo**, Vu-An Tran, Mitiku DamtieYehualaw (2018). Effect of high MgO content on the performance of alkali-activated fine slag under water and air curing conditions. Construction and Building Materials 186:503-513 (SCIE-Q1).
31. Trong-Phuoc Huynh, **Duy-Hai Vo**, Chao-Lung Hwang (2018). Engineering and durability properties of eco-friendly mortar using cement-free SRF binder. Construction and Building Materials 160:145-155 (SCIE-Q1).
32. Chao-Lung Hwang, Chi-Hung Chiang, Trong-Phuoc Huynh, **Duy-Hai Vo**, Bo-Jyun Jhang, Si-Huy Ngo (2017). Properties of alkali-activated controlled low-strength material produced with waste water treatment sludge, fly ash, and slag. Construction and Building Materials 135:459-471 (SCIE-Q1).

CONFERENCE PUBLICATIONS

1. Thanh-Vinh Ngo, **Duy-Hai Vo*,** Khanh-Dung Tran Thi, Tan-Khoa Nguyen, Vinh-Phuc Doan, Nguyen Van Bao Nguyen (2024). Effect Of Nano Aluminum Oxide On The Properties Of Mortars Produced From Ground Granulated Blast Furnace Slag Activated By CaO Combining With Seawater And Sea Sand. 2024 9th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB) 455-458.
2. **Duy-Hai Vo*,** Huynh Vo Duyen Anh, Chao-Lung Hwang, Chien-Ming Lu, Thi Thu Ha Truong, Thanh-Quang Tran (2024). Strength And Stability Of Concrete Samples Produced With Electric Arc Furnace Slag. 2024 9th International Conference on Applying New Technology in Green Buildings (ATiGB) 1-5.
3. Doan Vinh Phuc, **Vo Duy Hai**, Nguyen Thi Hong Nu, Nguyen The Duong, Nguyen Tan Khoa (2023). Variation of Compressive and Flexural Strength of High-Performance Fine-Grained Concrete within its Components: Some Experimental Results. 2023 8th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB) 257-262.
4. **Duy-Hai Vo**, Thi-My Ngo, Nhat-Long Phan, Khanh-Dung Tran Thi, Thi Thu Ha Truong (2023). A Study of Characteristics of the Mortar Produced from Waste Ceramic as a Fine Aggregate Replacement. 2023 8th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB) 217-220.
5. Khanh-Dung Tran Thi, **Duy-Hai Vo**, Min-Chih Liao, Chao-Lung Hwang (2023). Evaluating the Hardened Properties of Green Mortar Produced with the Blends of GGBFS and Waste Red Brick Powder Based on Alkali-Activated Materials. 2023 8th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB) 41-45.
6. Thi-My Ngo, **Duy-Hai Vo***, Nhat-Long Phan, Hoang-Anh Nguyen (2023). Strength development and microstructure evaluation of cement mortar incorporating various waste red brick powder. IOP Conference Series: Materials Science and Engineering, Volume 1289, The 4th International Conference on Transportation Infrastructure and Sustainable Development (TISDIC-2023) 26/08/2023 - 28/08/2023 Danang, Vietnam.
7. Mitiku Damtie Yehualaw, Akelilu Musback Eshetie, Begashaw Worku Yifru, **Duy-Hai Vo** (2023). Experimental Investigation on Properties of Mortar Containing Waste Marble as Fine Aggregate. Advancement of Science and Technology: Materials and Energy, 127-141.
8. Mitiku Damtie Yehualaw, Degsera Fantahun, Solomon Asrat Endale, Shumet Getahun, **Duy-Hai Vo** (2023). Investigation on Utilizing of Steel Slag as a Partial Replacement of Natural River Sand as a Fine Aggregate in Concrete Production. Advancement of Science and Technology: Materials and Energy, 143-165.
9. Nhat-Long Phan, **Duy-Hai Vo**, Thi-My Ngo, Hoang-Anh Nguyen (2022). Effect of waste red brick powder on fresh properties and strength development of cement paste. 2022 7th National Scientific Conference on Applying New Technology in Green Buildings (ATiGB) Danang, Vietnam.

10. **Duy-Hai Vo,** Khanh-Dung Tran Thi, Mitiku Damtie Yehualaw, Chao-Lung Hwang, Thi-My Ngo, Hoang-Anh Nguyen (2020). Engineering Properties of Cement Mortar Produced with Mine Tailing as Fine Aggregate. 2020 5th International Conference on Green Technology and Sustainable Development (GTSD).
11. **Duy-Hai Vo**, Khanh-Dung Tran Thi, Mitiku Damtie Yehualaw, Chao-Lung Hwang, Hoang-Anh Nguyen, Vu-An Tran (2020). Effect of Water-To-Solid Ratio on the Strength Development and Cracking Performance of Alkali-Activated Fine Slag under Water Curing Condition. 2020 5th International Conference on Green Technology and Sustainable Development (GTSD).
12. **Duy-Hai Vo**, Khanh-Dung Tran Thi, Nhat-Long Phan (2020). Effect of Steel Fiber on Engineering Performance of High-Strength Concrete. 6th National Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology 16-19.
13. Chao-Lung Hwang, **Duy-Hai Vo**, Khanh-Dung Tran Thi, Mitiku DamtieYehualaw (2020). Strength and engineering properties of cementless paste produced by GGBFS and MgO. CIGOS 2019 – INNOVATION FOR SUSTAINABLE INFRASTRUCTURE. Pages: 447-452. Year 2020.
14. CL Hwang, MD Yehualaw, **D-H Vo** (2019). Utilization of recycled concrete aggregate for high performance alkali activated concrete: Towards a sustainable building solution. IOP Conference Series: Materials Science and Engineering 690(1) 012001.
15. Chao-Lung Hwang, **Duy-Hai Vo**, Mitiku DamtieYehualaw, Vu-An Tran (2019). Improving The Strength and Engineering Properties of Alkali-Activated Slag –Rice Husk Ash Paste at the early ages with addition of various Magnesium Oxide Content. International Journal of Structural and Civil Engineering Research Vol. 8, No. 3, August 2019.
16. Vu-An Tran, Thanh-Duy Phan, Ngoc-Duy Do, **Duy-Hai Vo**, Hoang-Anh Nguyen (2019). Effect of fly ash on physical and mechanical properties of mortar. The 5th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology (3) 35-38.
17. Vu-An Tran, Ngoc-Duy Do, **Duy-Hai Vo** (2019). Assessment of mortar's properties using unground rice husk ash as fine aggregate. The 5th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology (17) 5-8.
18. Hoang-Anh Nguyen, Vu-An Tran, **Duy-Hai Vo** (2019). Utilization of fourier transform infrared on microstructural examination of sfc no-cement binder. The 5th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology 17 1-4.
19. Chao-Lung Hwang, **Duy-Hai Vo**, Mitiku DamtieYehualaw, Vu-An Tran (2018). Strength development and microstructure of alkali-activated slag-MgO in air curing condition. MATEC Web Conf. Volume 186, 2018.
20. **Duy-Hai Vo**, Chao-Lung Hwang (2018). Effect of high fly ash content on engineering properties of recycled aggregate concrete based on alkali-activated slag-fly ash. The 4th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology 2018.
21. Huynh Trong Phuoc, Nguyen Tien Dung, Ngo Si Huy**, Vo Duy Hai** (2018). An experimental study on properties of high-performance concrete using recycled aggregates. The 4th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology 2018.
22. Huynh Trong Phuoc, Hwang Chao Lung, **Vo Duy Hai** (2017). Compressive strength development and thermal conductivity of an eco-friendly cementless mortar. The 3th International Scientific Conference on Applying New Technology in Green Buildings (ATiGB). Published on The University of Danang, Journal of Science and Technology 46-49.

LOCAL JOURNAL PUBLICATIONS

1. Vu-An Tran, Hoang-Anh Nguyen, Bui Le Anh Tuan, **Duy-Hai Vo** (2024). Improvement of properties of high volume fly ash based self-compacting mortar with dolomite and ground granulated blast furnace slag. Journal of Science and Technology in Civil Engineering (JSTCE)-HUCE 18(3) 144-153.
2. Vu-An Tran, Hoang-Anh Nguyen, Bui Le Anh Tuan, **Duy-Hai Vo** (2023). Utilization of artificial lightweight aggregate and unground rice husk ash as internal curing agents to modify performance of super-sulfated cement mortar. Journal of Science and Technology in Civil Engineering (JSTCE)-HUCE 17(1) 94-110.