NEW CONTRIBUTIONS OF THE DISSERTATION

PhD Candidate: **Nguyen Hoang Anh**

Dissertation Title: **The impact of urban geometry and building configuration on outdoor thermal comfort in da nang city**

Major: **Architecture** Major Code: **9580101**

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- Optimizing building height (canyon ratio) and orientation significantly contributes to improving outdoor thermal comfort in Da Nang. An H/W ratio of 2.5 (the maximum possible ratio for local streets) yields the best improvement in thermal comfort. Additionally, an H/W threshold of 2.0 can be considered the minimum requirement; any ratio below this mark causes significant adverse effects on the outdoor thermal comfort. As for the East-West orientation in particular, increasing the ratio to 4.0 is still insufficient for buildings to completely shade the street surface.

- The North-South orientation is identified as favorable for outdoor thermal comfort, whereas the East-West orientation is the most unfavorable and requires further support from other passive strategies.

- High-rise buildings, while limiting natural ventilation, are capable of shielding solar radiation, which reduces air temperatures and mitigates hot PET areas in adjacent canyons.

- In terms of building configuration, a widespread low-rise typology covering the entire plot is identified as the most unfavorable for outdoor thermal comfort. Such model cannot create adequate shading for the street surface and occupies substantial ground space that could otherwise accommodate vegetation. Conversely, an edge-aligned configuration with an H/W ratio exceeding 2.0 serves as an effective strategy, providing expansive shading over the street while liberating ground-level space for greenery.

- For areas with fixed spatial configurations, increasing vegetation density serves as the most effective intervention for achieving a pronounced cooling effect.

Doctoral candidate