

INFORMATION
ON THE NEW CONTRIBUTIONS OF DOCTORAL THESIS
(Information will be posted on the Website)

Title: **Some distance functions in quantum information theory and related problems**

Speciality: Calculus Code. No: 9460102.

PhD student: Vuong Trung Dung

Course: 9

Advisors: 1. Advisor 1: Assoc. Prof. Dr. Le Cong Trinh
2. Advisor 1: Assoc. Prof. Dr. Dinh Trung Hoa

Training institution: **Quy Nhon University**

NEW CONTRIBUTIONS OF THE THESIS

1. Introducing a new distance on the set of positive definite matrices, called weighted Hellinger distance, and investigating its properties.
2. Constructing a new quantum divergence, named the α -z-Bures Wasserstein divergence, while simultaneously demonstrating that the corresponding least squares problem for this quantum divergence has a unique solution and exploring the properties of this solution.
3. Introducing some new inequalities and properties for quantum fidelity, as well as its extended version, while utilizing the extended quantum fidelity to determine the distance between two unitary orbits.
4. Introducing a new weighted spectral geometric mean and investigating its properties, contributing to a comprehensive understanding of the matrix spectral geometric mean landscape.

Binh Dinh, on December 25, 2023

Advisors
(Signature)



Assoc. Prof. Dr. Le Cong Trinh

PhD Student
(Signature)



Vuong Trung Dung