

## **SUMMARY OF PHD DISSERTATION**

Thesis title: Shortest paths along a sequence of line segments and connected orthogonal convex hulls

Speciality: Applied Mathematics

Speciality code: 9 46 01 12

PhD. student: Phong Thi Thu Huyen

Supervisors: Associate Professor Phan Thanh An

Training Institute: Institute of Mathematics, Vietnam Academy of Science and Technology

### **The main results of the thesis include:**

1. Some analysis and geometric properties of shortest paths between two points in a Euclidean space  $E$  are shown.
2. The existence and uniqueness of shortest paths and conditions for concatenation of two shortest paths to be a shortest paths are shown.
3. Shortest paths between two points on polygons, sequences of adjacent triangles in 2 and 3 dimensional-spaces, in especially on straightest paths on a sequence of adjacent triangles are considered.
4. The connected orthogonal convex hull of a planar point set is the intersection of all connected orthogonal convex sets of the given set under the assumption of no semi-isolated point.
5. The concept of extreme vertices of the connected orthogonal convex hull

of a finite planar point set under the same condition is presented and the construction of the connected orthogonal convex hull via extreme points is produced.

6. An efficient algorithm and the lower bound of all algorithms for finding the connected orthogonal convex hull of a finite planar point set is presented.

**Supervisors**

**PhD. Student**

**Ass. Prof. Phan Thanh An**

**Phong Thi Thu Huyen**