

Information on Doctoral thesis of Fellows Le Quang Thao

1. Full name: Le Quang Thao
2. Sex: Male
3. Date of birth: 28-10-1982
4. Place of birth: Thanh Hoa
5. Admission decision number: 1691/QD-SDH, Signed 07/05/2009 by President of Vietnam National University, Hanoi
6. Changes in academic process: None
7. Official thesis title: Research in development technique in digital phased array antenna for X-band receiver
8. Major: Radiophysics
9. Code: 62440105
10. Supervisors: Dr. Nguyen Thi Ngoc Minh

Assoc.Prof.Dr. Pham Quoc Trieu

11. Summary of the new findings of the thesis

1. Using parallel computing technique in parallel genetic algorithm to solve the adaptive signal problem.

We propose to apply the advantage of parallel digital processor in computing amplitude parameter of genetic algorithm which deeply reduces noise from specified direction.

2. Using parallel computing technique in estimating direction of arrival signal using MUSIC algorithm.

By doing so, the computational cost for estimating and evaluating direction of arrival signal reduce noticeable. This advantage will be more clearly while we enhance the target resolution.

3. Using computational result to quickly evaluate and verify the far-field antenna pattern of phased array antenna.

The thesis has successfully built fast far-field pattern measurement system which does not require rotate radiative direction of antenna.

We have tested in phased array antenna band X (4 x 8 elements) in anechoic chamber for verifying the methodology proposed in this thesis

12. Practical applicability, if any:

Improve the performance of surveillance RADAR system in order to quickly minimum noise power in specified target, obtain the better target resolution, and optimize the computational cost.

13. Further research directions, if any:

Complete the multi-functional program which could apply for almost every antenna system

14. Thesis-related publications:

- Le Quang Thao, Nguyen Ngoc Dinh, Do Trung Kien (2011), "Amplitude and phase adaptive nulling with a genetic algorithm for array antennas", *Vnu, Journal of Science, Mathematics - physics* 27 (1S), pp.223-227.

- Le Quang Thao, Dam Trung Thong, Nguyen Thi Ngoc Minh (2011), "Fast solution for main beam pattern measurement using digital beam forming technique", *AIMSEC Proceedings, Zhenzhou, China, Aug 8-10*, pp.6655-6658.

- Le Quang Thao, Dam Trung Thong, Do Trung Kien (2011), "Simulation and comparison of parabolic and phased array antenna in radar technologies", *CLMV-02 Proceedings, Vinh, Vietnam Oct 11-15*, pp167- 171.

- Le Quang Thao, Nguyen Thi Ngoc Minh (2012), "Adaptive nulling with parallel genetic algorithm in phased array antenna", *Tạp chí Nghiên cứu KH&CN Quân sự* 20, pp.7-13.

- Le Quang Thao, Dam Trung Thong, Nguyen Thi Ngoc Minh (2012), "Parallel computing in genetic algorithm for adaptive array antenna", *ACAI Proceedings 1, Xiamen, China, Mar 24-26*, pp.511-515.

- Le Quang Thao, Dam Trung Thong, Nguyen Thi Ngoc Minh (2012), "Fast and High Resolution In Direction of Arrival Estimation Using Parallel MUSIC", *ACAI Proceedings 2, Xiamen, China, Mar 24-26*, pp.1132- 1136

- Le Quang Thao, Dam Trung Thong (2012), "Computation Power And Number of Basics Radiator for Radar System using Phased Array Antenna", *Canadian Journal on Electronics Engineering (online version)*3 (5), May 2012. pp.262-265.

- Le Quang Thao, Dam Trung Thong, Do Trung Kien (2012), "Research and comparison of performance of direction of arrival algorithms for smart antenna system", *Vnu, Journal of Science, Mathematics - physics* 28 (1S), pp.141-147.

- Le Quang Thao, Dam Trung Thong, Do Trung Kien (2012), "Adaptive array antenna with different models of genetic algorithm", *Vnu, Journal of Science, Mathematics - physics* 28 (1S), pp.148-153.