Curriculum Vitae

PERSONAL DATA

Truong Khoa Phan, PhD
Research Associate, Department of Electronic and Electrical Engineering, University College London.

Email: t.phan@ucl.ac.uk or ptkhoa1984@gmail.com

Website: www.ee.ucl.ac.uk/~uceetkp

Main research interests: network optimization, software-defined networks (SDN), network function virtualization (NFV), P4 (Programming Protocol-Independent Packet Processors - the next evolution of OpenFlow), multicast protocol, cloud computing, green networking and TCP congestion control.

WORKING EXPERIENCE

Research Associate, University College London (UCL) 2014 - present

- EU FP7 FUSION, EPSRC COMIT, EU CONCERT, EU UMOBILE.
- Teaching parts of MSc course in Cloud Computing
- With expertise in optimization, I have led the design and implementation of a utility-based framework used in service placement and selection (for atomic services and for NFV service chaining) to guarantee QoS, fairness and to satisfy cost constraints. The algorithm can be solved in polynomial time and it can work both in a centralized and a distributed manner for large-scale systems. Besides, my work in designing Xcast6 Treemap – a new multicast protocol can link to modern networking technologies: SDN (to perform Xcast traffic engineering), NFV (to quickly deploy Xcast routers), P4 (to implement Xcast forwarding functionality in routers) and BIER (Bit Indexed Explicit Replication) (to provide a stateless multicast protocol).

Assistant Lecturer, HCMC University of Technology, Vietnam. 2007 - 2010

- Teaching: Computer Network, Operating System, Parallel Processing and Distributed System.
- I worked on the ALM-FRC (Application Layer Multicast – Fast Route Convergence) project (funded by Panasonic). I led the design and implementation of an overlay algorithm for video conferencing system with fast adaptation with network condition changes.

EDUCATION

PhD in Computer Science, INRIA Sophia Antipolis, France 2011 – 2014

- Thesis: “Design and Management of Green Networks with Low Power Consumption”.
- Advisor: Prof. Joanna Moulierac and Dr. David Coudert
- Grade: “Très Honorable” (Very Honorable)
- In this work, I used optimization methods (integer linear program and heuristic algorithms) in designing new energy-aware routing models. Those algorithms need a centralized controller (e.g. SDN controller) to perform traffic engineering in order to save energy for the networks. I found that the limitation in routing table length in TCAM (Ternary Content-Addressable Memory) of OpenFlow switches can affect energy-aware routing solution and I developed optimization algorithms (mixed integer linear programs and heuristic algorithms) to address

this problem. In addition, my theoretical work on gamma-robust optimisation and cutting-plane method are used to speed-up the resolution of the proposed algorithms.

Master of Science, INRIA – I3S (UNS- CNRS), France 2010 - 2011

- Thesis: "Minimization of Network Power Consumption with WAN Optimization"
- Advisor: Prof. Joanna Moulierac
- Rank: 3/18
- In this work, I designed a new energy-aware routing model with the support of WOC (Wide Area Network Optimisation Controller). Given the fact that WOC devices consume more energy than usual, I formulated the problem to show the trade-off between energy cost and the benefits that WOC can bring (e.g. saving bandwidth).

Bachelor of Engineering, HCMC University of Technology, Vietnam. 2002 - 2007

- Thesis: "MaxNet TCP Congestion Control"
- Advisor: Prof. Nam Thoai
- Rank: 1/250
- I have deployed a testbed to show advantages of MaxNet TCP protocol in a distributed environment. With "zero queue" at routers, I showed that MaxNet guarantees low response time for mice traffic (e.g. HTTP traffic) when sharing resources with elephant flows (e.g. FTP traffic).

OTHER ACTIVITIES

- **Reviewer**: IEEE Transactions on Communications, IEEE/ACM Transactions on Networking, Computer Network, IEEE ICC, IEEE GlobeCom, ONDM, IEEE GlobeCom and SEA.
- **Assist in supervising PhD students at UCL:** 2 students.
- **Supervision of bachelor theses**: 6 students (in Vietnam) and **master projects**: 2 students (University of Nice Sophia, France), 1 student (UCL, UK).

PUBLICATIONS

Journals and Magazines:

[J1] P. Simoens, D. Griffin, E. Maini, T. K. Phan, M. Rio, L. Vermoesen, F. Vandeputte, F. Schamel and D. Burstynowski, "Service-centric Networking for Distributed Heterogeneous Clouds", IEEE Communications Magazine, 2017.

[J2] D. Coudert, A. Kodjo and T. K. Phan, "*Robust Energy-aware Routing with Redundancy Elimination*", Journal of Computers and Operations Research, 2015.

[J3] J. Moulierac and T. K. Phan, "Optimizing IGP Link Weights for Energy-efficiency in Multi-period Traffic Matrices", Computer Communications, 2015.

[J4] F. Giroire, J. Moulierac, T. K. Phan and F. Roudaut, "*Minimization of Network Power Consumption with Redundancy Elimination*", Computer Communications, 2015.

[J5] K. T. Phan, T.T. Tran, D.D. Nguyen and N. Thoai, "*MaxNet and TCP Reno/RED on Mice Traffic*", *in* Modeling, Simulation and Optimization of Complex Processes, Springer 2012.

Conferences and Workshops:

[C1] E. Maini, T. K. Phan, D. Griffin and M. Rio, "*Hierarchical Service Placement for Demanding Applications*", in IEEE GlobeCom workshop, USA, 2016.

[C2] T. K. Phan, D. Griffin, E. Maini and M. Rio, "*Utility-maximizing Server Selection*", in IFIP Networking, Vienna, Austria, 2016.

[C3] F. Vandeputte, L. Vermoesen, D. Griffin, T. K. Phan, M. Rio, et al. "*Evaluator Services for Optimised Service Placement in Distributed Heterogenous Cloud Infrastructures*", in EuCNC, France, 2015.

[C4] F. Giroire, J. Moulierac and T. K. Phan, "*Optimizing Rule Placement in Software-Defined Networks for Energy-aware Routing*", in IEEE GlobeCom, USA, 2014.

[C5] D. Coudert, A. Kodjo and T. K. Phan, "*Robust Optimization for Energy-aware Routing with Redundancy Elimination*", in Algotel, France, 2014.

[C6] D. Coudert, A. M. C. A. Koster, T. K. Phan and M. Tieves, "*Robust Redundancy Elimination for Energy-aware Routing*", in IEEE GreenCom, Beijing, China, 2013.

[C7] A. Koster, T. K. Phan and M. Tieves. "*Extended Cutset Inequalities for the Network Power Consumption Problem*", in INOC, (Electronic Notes in Discrete Mathematics), Spain, 2013.

[C8] F. Giroire, J. Moulierac, T. K. Phan and F. Roudaut, "*Minimization of Network Power Consumption with Redundancy Elimination*", in IFIP TC6 Networking, Czech Republic, 2012.

[C9] T. K. Phan, J. Moulierac, N.C. Tran and N. Thoai, "*Xcast6 Treemap Islands – Revisiting Multicast Model*", in ACM CoNEXT Student Workshop, Nice, France, 2012.

[C10] K. T. Phan, N. Thoai, E. Muramoto, K.K. Ettikan, B.P. Lim and P.Y. Tan, "*Treemap – the Fast Routing Convergence Method for Application Layer Multicast*", in 7th IEEE CCNC, USA, 2010.

[C11] B.P. Lim, K.K. Ettikan, E.S. Lin, T.K. Phan, N. Thoai, et al. "*Bandwidth Fair Application Layer Multicast for Multi-party Video Conference Application*", in 6th IEEE CCNC, USA, 2009.

Note: Most of the publications during my PhD are in alphabetical order.