Dear Colleagues,

We are seeking for 4 research assistants (RA) to work on next generation wireless networking projects for the duration of **18 months**. Newly registered postgraduate students who are still looking for topic and research direction are preferred. We will work with the university supervisors on research direction, provide guidance and necessary tools for their works. Below are the detailed project descriptions:

Project 1 – Two-tier Wireless Network System (2 RAs)

This project embarks to investigate application of a two-tier wireless network system with integrating wireless access and wireless backhaul as the evolution path of migrating our national communication infrastructure to the next generation communication system. The solution is a part of answers to the challenges outlined in the ETP, such as to increase internet penetration rate and to provide ad hoc access fulfilling the thirst for mobile broadband with the advantages of low CAPEX, and short time frame in deployment. The first tier of the network system is the wireless access network which provides interface for user accessing to internet and enjoy services such as voice over IP, web browsing, and social network. The second tier is the backhaul network in which comprises of a number of wireless routers that carry traffic from various access networks to a gateway.

The project, in defining the evolution of our national communication infrastructure, covers the following tasks:

1. Research and investigate the migration path for our national communication infrastructure.
   a. Review and examine last mile network, identifying the causes of bottleneck that effect network performance.
   b. Feasibility and compatibility analysis of adopting wireless access and wireless backhaul.
2. Research and design a mobile broadband infrastructure that meets the demand and requirement of our nation with integration of wireless access and wireless backhaul networks.
   a. Fusion of backhaul and access networks, seamless connections from individual access points to the core network.
   b. Research novel protocols and routers that can fulfil wireless backhaul network, providing carrier grade linkage to transport aggregated traffic between access networks and the core network.
   c. Performance analysis and evaluation of mobile broadband service in the proposed integrated wireless network.
3. Proof of concept with realistic testbed
   a. Two-tier wireless network design, optimisation and prototype.
   b. Optimisation of relay mechanism to provide fairness and quality of service.

Essential skills:
- Excellent C/C++ programming
- Working knowledge of TCP/IP, Ethernet, and WiFi
- Excellent written and verbal communication
- Working knowledge of tools such as Wireshark, Jperf, Iperf, etc
- Understanding of Linux Kernel compiling
- Excellent analytical skills

Desirable skills:
IEEE 802.11s, open mesh 11s, programming and development of network protocol.

MIMOS Berhad
Technology Park Malaysia
Bukit Jalil, Kuala Lumpur

Project 2 - Coverage and Capacity Optimization for 4G Heterogeneous Multi-hop Broadband Wireless Networks (2 RAs)

The objectives of this project are:

1. To design a 4G heterogeneous, multiradio, multihop wireless network architecture and functional modules.
2. To model a large-scale network which comprises traffic & user behaviour, coverage (or spatial model) & capacity models
3. The modelling work will adopt both static system level (i.e. snapshot-based) and dynamic system level (i.e. event-driven) approaches. The Morte-Carlo technique will then be applied to generate the expected performance.
4. To formulate optimization objectives and develop suitable optimization techniques based on the identified use cases or scenarios and deployment goals.
5. To carry out case studies and performance analysis for different geographical environments, traffic loading conditions, application types, etc.
6. To compare and contrast the performance of different optimization techniques.

Essential skills:
- Good academic results in wireless and comms related subjects
- Good background in Matlab, Basic, C/C++ programming
- Good analytical skills
- Good written and verbal communication

Desirable skills:
- IEEE 802.11s, network simulators such as ns2/3, Qualnet or OPNET or equivalent

The ideal candidates for the above posts will have at least a 1st or 2nd upper class degree from a good university in computer science, software, computer, telecom engineering or equivalent and currently registered or intend to register as a postgraduate student.

We offer very generous monthly allowance for the successful students. If you are interested please send your CV and a cover letter to Dr. Kwong Kae Hsiang (kh.kwong@mimos.my) and Dr. David Chieng (ht.chieng@mimos.my)