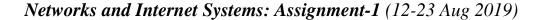# UCT MSc in Computer Science 2019

Networks and Internet Systems: Assignment-1 (12-23 Aug 2019)

In this assignment, you are to analyze the Internet topology interconnecting African universities. You will use a distributed Internet measurement platform called Ripe Atlas[1] to study the geo-topology and performance between at least 20 universities in Africa. You will select universities' websites/web-servers as targets for your measurements (you can only select a maximum of 3 universities from each country). You will choose 3 probes as vantage points from each of the countries selected. In the end, your will write a report in which you will: (1) discuss what what you observe, particularly in terms of Internet delays and geo-location of paths; (2) draw and discuss a geo-topology map that combines the results from the two tasks.

The first task (Task-1) is to run intra-country measurements - ping and traceroute from vantage points that within the same country as the target servers. In Task-2, you will run inter-country measurements - ping and traceroute from each country to all the selected webservers that are in other countries. For both Task-1 and Task-2, you will need to analyse the following: 1) end-to-end delays; 2) AS-level hops (number of ASN hops, and what ASNs are traversed between source and destination); 3) country-level hops (which countries are traversed between source and destination). It is recommended to automate the Ripe Atlas measurements, e.g using Atlas-Cousteau.[2] You can use Maxmind[3] database to determine the ASN and location country of each IP in the traceroute data.

What to submit:
Submit a report of **5-7-pages** (including the graphs and topologies). The report should include discussion of the tasks undertaken, the results and discussion of the results. You will submit zip-folder containing the report, as well as measurement/analysis scripts and data.

** to use Ripe Atlas, you will first need to register an account[4]. Once you have done so, do let me know the email address you are using for logging into Ripe Atlas, and I will transfer to your account the credit you need to run experiments.

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[1] https://atlas.ripe.net/
[2] https://github.com/RIPE-NCC/ripe-atlas-cousteau
[3] https://dev.maxmind.com/geoip/geoip2/geoip2-city-country-csv-databases/
[4] https://access.ripe.net/registration