Post-Doc position in SDN-based Traffic Scheduling for future Datacenter Networks

Laboratoire Informatique d'Avignon (LIA)
Avignon Université

Work description: Laboratoire Informatique d'Avignon (LIA) is seeking a highly motivated and talented candidate in the field of traffic engineering for future datacenter networks. The perspective candidate will work on resource allocation via Machine Learning for datacenter traffic optimisation. It is required that the candidate has strong background Computer Networks, in Software Defined Networks (SDN). This research project is designed towards the understanding of the structure of traffic sources in datacenter networks and, using suitable modelling and algorithmic tools, it aims at improving the performance and fairness' footprint of scheduling decisions operated by SDN controllers. The postdoc position is for 1 years. Competence in mathematical modelling and performance evaluation is considered a plus.

Required Degree: the ideal candidate will have a PhD in Computer Science, Information Engineering, or equivalent with these on Computer Networks, with some background on SDN. Knowledge of Big Data frameworks such as MapReduce, Hadoop and Spark is considered a plus. Fluency in English is essential. The candidate should have good practice with teamwork, group learning processes and a problem-solving attitude.

Project Context: the research topic targets the development of a new technical solution for the problem of competition among coflows. Coflows are generated under various frameworks for distributed computation, e.g., in Hadoop, where consecutive computation stages are interleaved with communication, creating swarms of flows across racks within the datacenter traffic. The peculiar features of these very specific traffic sources requires to rethink the scheduling logic in order to be able to allocate flow routes over the datacenter fabric towards a global optimization objective, while complying with the constraints of the SDN controller, e.g., in terms of control channel requirements. The post doc position will be part of a challenging industrial project oriented towards the development of future generation datacenter flow schedulers.

Required Skills: the ideal candidate should have solid knowledge of standard SDN controller technology (e.g., OpenDaylight), and of the Openflow protocol. Furthermore, familiarity with

distributed computation frameworks to handle Big Data is considered a plus, in particular MapReduce and/or Spark. Knowledge of dataplane programming languages, e.g. P4, and some knowledge of current datacenter monitoring technology (e.g., DiG) is also considered a plus. It is expected a certain seniority with respect to algorithmic implementation and performance evaluation, e.g., via large scale simulation and/or emulation of telecommunication systems.

To apply: interested candidates can contact the following members of the LIA
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for further information on the project and workplace laboratory.