Post-Doc position in Mathematical Modelling for future Datacenter Networks

Laboratoire Informatique d'Avignon (LIA)
Avignon Université

Work description: the Laboratoire Informatique d'Avignon (LIA) is seeking a highly motivated and talented candidate in the field of traffic engineering for future datacenter networks. The candidate will work on resource allocation for datacenter traffic optimisation. The candidate should have a background in mathematical modeling, distributed optimization, performance evaluation and algorithms applied to Computer Networks. 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 year.

Required Degree: the ideal candidate will have a Ph.D. in Computer Science, Operations research, or Information Engineering. 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 new mathematical models for joint routing and scheduling in datacenters, with respect to 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 rethinking 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 switches and SDN controllers, e.g., in terms of control channel requirements. The postdoc position will be part of a challenging industrial project, whose aim is to provide a theoretical support for the development of future generation SDN controllers and switch fabrics.

Required Skills: The ideal candidate should have a background in applied mathematics, with orientation to communication networks. Her/his curriculum should prove excellent research records in relevant subjects such as, e.g., control theory, queueing theory, scheduling,

performance evaluation, mathematical programming and algorithmic design. Familiarity with SDN controller technology (e.g., OpenDaylight), datacenter routing and of Openflow is considered a plus.

To apply: interested candidates can contact the following members of the LIA Department
Prof. Francesco de Pellegrini email francesco.de-pellegrini@univ-avignon.fr
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for further information on the project and workplace laboratory.