

## Séminaire

### Equipe « Réseau »

Lundi 07 Juin 2021  
14h00

## Access control in NB-IoT networks: a deep reinforcement learning strategy

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**Abstract:** IoT objects connections and especially Machine-to-Machine (M2M) communications are considered as one of the most important evolution of the Internet. Supporting these devices is, however, one of the most important challenges facing network operators. Indeed, the huge number of devices that might try to access the network at the same time could lead to heavy congestion or even total saturation, with all the consequences that this may entail. Indeed, a very limited number of devices simultaneously trying to access the network may drop network performance down to zero, regardless of the available access opportunities. Under these circumstances, it seems obvious that effective access control mechanisms are needed to maintain a reasonable number of access attempts. This unfortunately represents a major challenge because the number of terminals wanting to connect remains unknown, even though there are techniques that can estimate this number more or less precisely. In order to overcome this problem, we have proposed to exploit the potential of deep reinforcement learning techniques, which better reveal the state of the network and thus allow a more precise control of the number of arrivals.

**Short Bio:** Yassine HADJADJ AOUL is currently working as an associate professor at the University of Rennes 1, France, where he is also a member of the IRISA Laboratory and the INRIA project-team Dionysos. Dr. Hadjadj received his Master's and Ph.D. degrees in computer science from the University of Versailles, France, in 2002 and 2007, respectively. He was an assistant professor at the University of Versailles from 2005 to 2007, where he was involved in several national and European projects such as NMS, IST-ATHENA, and IST-IMOSAN. He was also a post-doctoral fellow at the University of Lille 1 and a research fellow, under the EUFP6 EIF Marie Curie Action, at the National University of Dublin (UCD), where he was involved in the DOM'COM and IST-CARMEN projects. His main research interests concern the fields of wireless networking, multimedia streaming architectures and protocols, congestion control protocols and QoS provisioning, and satellite and space communications.