Connectionless Transmission in Wireless Networks (IoT):

Mots clés :
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- Domaine scientifique principal: Sciences et technologies de l'information et de la communication

Résumé du projet de recherche (Langue 1)

The subject will be to construct some next-generation access protocols, for IoT (or alternately for vehicular networks). One starting point are methods from the family of Non-Orthogonal Multiple Access (NOMA), where multiple transmissions can "collide" but can still be recovered - with sophisticated multiple access protocols (MAC) that take physical layer/channel into account. One such example is the family of the Coded Slotted Aloha methods. Another direction is represented by some vehicular communications where vehicles communicate directly with each other without necessarily going through the infrastructure. This is true also more generally in any wireless network where the control is relaxed (such as in unlicensed IoT networks like LoRa). An observation is that in such distributed scenarios, explicit or implicit forms of signalling (with sensing, messaging, ...) can be used for designing sophisticated protocols - including using machine learning techniques. During the thesis, some of the following tools could be used: protocol/algorithm design (ensuring properties by construction), simulations (ns-2, ns-3, matlab, ...) on detailed or simplified network models, mathematical modelling (stochastic geometry, etc...) ; machine-learning techniques or modelling as code-on-graphs.