Monday 11 March 2019
14h00 – 15h00
INP-ENSEEIHT, Salle des thèses

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SPOT Seminar: Recent results in worst-case evaluation complexity for smooth and non-smooth, exact and inexact, nonconvex optimization

**Abstract:** We present a review of the results obtained during the last year on the worst-case complexity of minimization algorithm for nonconvex problems using potentially high-degree models. In the smooth (Lipschitz or Hölder) case, global complexity bound will be presented that are valid for any model's degree and any order of optimality, thereby generalizing all known results for first- and second-order methods. The bound states that an adaptive regularization algorithm using derivatives up to degree $p$ will produce an epsilon -approximate $q$-th order minimizer in at most $O(\epsilon^{(p+1)/(p-q+1)})$ evaluations. Moreover, these results are shown to be sharp. We will also show how to extend these optimal-complexity results to the case where the problem's objective function and derivatives are computed inexactly, yielding a bound of $O(\log(\epsilon)\epsilon^{(p+1)/(p-q+1)})$ approximate evaluations. Co-authored with C. Cartis, N. Gould, S. Bellavia, G. Gurioli, B. Morini