

For a general nonlinear control systems

$$\dot{x} = f(x, u), \quad x \in \mathbb{R}^n, u \in \mathbf{U} \subseteq \mathbb{R}^m, f \text{ smooth},$$

stabilization and optimization problems cannot be solved within the class of continuous feedback laws. In this seminar, we present some recent results and some examples concerning a particular class of discontinuous feedback controls, the patchy feedbacks, which not only allow to solve stabilization and optimization problems but, despite their lack of continuity, still admit Carathéodory solutions for the resulting ODE  $\dot{x} = f(x, U(x))$ .