1106-34-2619 **Peter R Wolenski*** (wolenski@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803. *Structured discontinuous systems.*

We provide a framework to study optimal control systems with discontinuous dynamic data, but in which the state space is structured in a structured manner that allows for a complete description of the state trajectories. The framework is of a Whitney-type stratification and consists of a partition of the state space into submanifolds of various dimensions, and on each is endowed nice dynamics satisfying a structural condition. The latter is imposed to regulate the "jumping off" of a continuous trajectory from one manifold into another. A key assumption on the submanifolds is that their closures are proximally smooth and relatively wedged, concepts from nonsmooth analysis that allow for a detailed description of trajectories that originate from the boundary of the submanifold and that can penetrate into it. The main issue is to develop optimal control theory in the whole space in which a well-developed theory is available on each of the submanifolds. We offer some examples and results on weak and strong invariance, and suggest possible future research directions. (Received September 16, 2014)