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**Andrew D Lewis\*** ([andrew@mast.queensu.ca](mailto:andrew@mast.queensu.ca)), Department of Mathematics & Statistics,  
Queen's University, Kingston, ON K7L 3N6, Canada. *The local structure of affine systems.*

In the usual framework of control-affine systems, one makes a choice of drift vector field and control vector fields, then studies system properties in terms of this choice. However, it is the case that different choices of drift vector field and control vector fields can generate the same class of trajectories; two such choices are called *feedback equivalent*. To understand the geometry of a control-affine system, one should study the equivalence class and not a choice of representative given by a particular set of drift and control vector fields. Associated to an equivalence class under feedback equivalence is an affine subbundle of the tangent bundle of the state manifold.

In this work, a setting for studying the local structure of affine subbundles is presented. Such a framework should be useful for understanding geometric properties of control-affine systems; for example obstructions to local controllability and stabilisability. To give some idea of the tools one might use in such investigations, we initiate the study of local controllability using jet bundles of affine subbundles. The use of jet bundles leads to algebro-geometric conditions for, and obstructions to, local controllability. (Received January 12, 2008)