Dirac structures and Port-Hamiltonian systems

Eduardo García-Toraño Andrés (U.N.S., Argentina)

The theory of Port-Hamiltonian systems (PHS) provides a geometric framework that unifies network theory with the Hamiltonian description of physical systems. In this approach, the geometry is given by a Dirac structure determined by the interconnecting structure of the system.

In this talk, we will first review the basic properties of Dirac structures and see how PHS are defined. Then we will try to uncover the geometry behind some of the constructions that appear in the literature of PHS. The talk will be self-contained.

References:

[1] Theodore James Courant. Dirac manifolds. *Trans. Amer. Math. Soc.*, 319(2):631–661, 1990.

[2] Morten Dalsmo and Arjan van der Schaft. On representations and integrability of mathematical structures in energy-conserving physical systems. *SIAM J. Control Optim.*, 37(1):54–91, 1999.