Towards an Optimal Energy Management for Hybrid Vehicle using ACC with Stop&Go Maneuvers based on Dynamic Programming*

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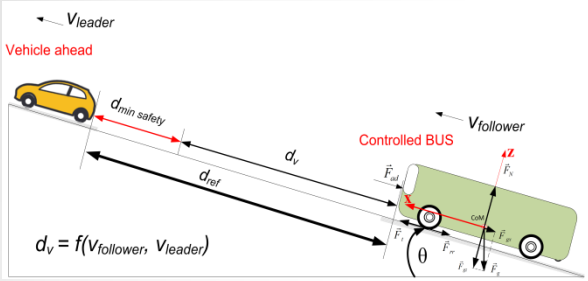
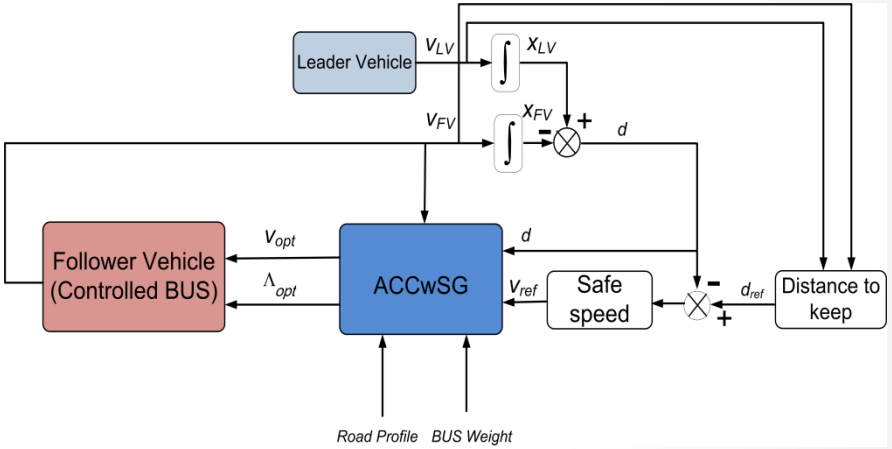
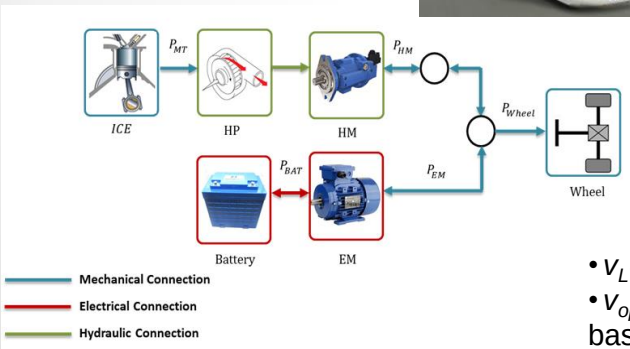


ACCwSG principle

Objective: development of the ACC (Adaptive Cruise Control) with Stop&Go (ACCwSG) functionalities in order to improve the fuel economy while maintaining the passengers comfort of a tri-hybrid urban bus.



Control scheme of the ACCwSG



BUS powertrain architecture:

EM – electric motor
HM – hydraulic motor
HP – hydraulic pump
ICE – internal combustion engine
P_{HM}, P_{EM}, P_{wheel} – HM, EM power and power at the wheels

- v_{LV}, v_{FV}: leader and follower vehicle speeds
- v_{opt} , Λ_{opt}: sub-optimal speed profile and related power split ratio for HEV, obtained by DP-based algorithm solutions
- d current inter-vehicular distance
- **Distance to keep** block: provides inter-vehicular distance d_{ref} to maintain between the vehicles
- **Safe speed** block: calculates the speed set-point v_{ref} needed to keep the reference distance $d_{ref} = d_{min\ safety} + d_v$

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