



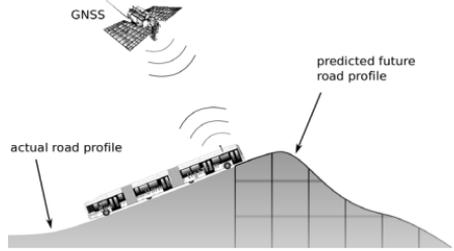
AHEAD - a predictive energy management for hybrid electric buses in public transportation

Philipp Elbert | Hans-Jörg Gisler | Prof Lino Guzzella
elbertp@ethz.ch | www.ahead.ethz.ch



This project aims to minimise CO₂ emissions of hybrid-electric buses used in public transport. In hybrid buses, the level of CO₂ emissions greatly depends on the energy management system regulating the power split between the battery and the engine. Simulations show that a hybrid-electric bus with a good standard strategy emits 15-20% less CO₂ than an equally sized diesel bus. However, the bus could potentially achieve savings of as much as 25-30%. So what is the problem with the standard strategy? The answer is that it cannot factor in future events, which leads to efficiency being compromised.

We have developed a new predictive strategy that uses a GNSS sensor to determine the exact position of the vehicle, which in turn allows us to factor in information on the elevation profile further ahead. This is possi-



© ETH Zurich and HESS

ble, because buses used in public transport typically follow predefined routes. Simulations have shown that with our new predictive strategy hybrid busses would emit 25-30% less CO₂ than a comparable diesel bus. Thus, our new predictive strategy helps cut CO₂ emissions of hybrid-electric buses by 5-15%.

sponsored by KTI

Switzerland



swiss aerospace cluster // The swiss aerospace cluster is an agile network and non-profit organisation for pooling information across companies and organisations, thereby increasing development potential and promoting innovative products. Switzerland ranks first among 125 economies in terms of innovation levels (Global Innovation Index 2011). The cluster's members include academic and research organisations, as well as companies in the field of aerospace technologies, such as satellite navigation. The cluster supports access to attractive future markets and boosts the competitiveness of the industry and research in Switzerland.

swiss aerospace cluster
Sagrain 25
CH-6404 Greppen / Lucerne
Switzerland

Mr Michel Jaquet
+41 41 390 37 24
info@swiss-aerospace-cluster.ch
www.swiss-aerospace-cluster.ch

