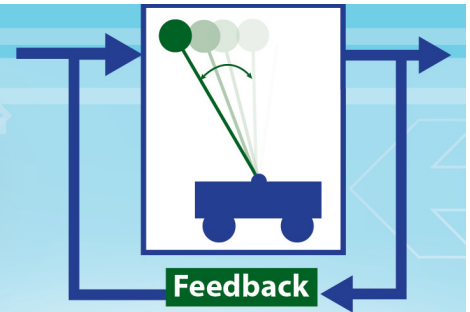


COLLEGE OF ENGINEERING

# Control Seminar



Sponsored by: Bosch, Ford, and Toyota

## Collaborative Road Freight Transport



**Karl H. Johansson**

KTH Royal Institute of Technology

**Friday, April 13, 2017**

**3:30 – 4:30 pm • 1500 EECS**

**ABSTRACT:** Freight transportation is of outmost importance for our society. Goods transport in the EU amounts to 3.5 trillion tonne-km per year with 3 million people employed in this sector, whereas people transport amounts to 6.5 trillion passenger-km with 2 million employees. Despite the influence the transportation system has on our energy consumption and the environment, road goods transportation is mainly done by individual long-haulage trucks with no real-time coordination or global optimization. In this talk, we will discuss how modern information and communication technology supports a cyber-physical transportation system architecture with an integrated logistic system coordinating fleets of trucks traveling together in vehicle platoons. From the reduced air drag, platooning trucks traveling close together can save more than 10% of their fuel consumption. Control and estimation challenges and solutions on various level of this transportation system will be presented. It will be argued that a system architecture utilizing vehicle-to-vehicle and vehicle-to-infrastructure communication enable optimal and safe control of individual trucks as well as optimised vehicle fleet collaborations and new markets. Extensive experiments done on European highways will illustrate system performance and safety requirements. The presentation will be based on joint work over the last ten years with collaborators at KTH and at the truck manufacturer Scania.

**BIO:** Karl H. Johansson is Director of the Stockholm Strategic Research Area ICT The Next Generation and Professor at the School of Electrical Engineering, KTH Royal Institute of Technology. He received MSc and PhD degrees in Electrical Engineering from Lund University. He has held visiting positions at UC Berkeley, Caltech, NTU, HKUST Institute of Advanced Studies, and NTNU. His research interests are in networked control systems, cyber-physical systems, and applications in transportation, energy, and automation. He is a member of the IEEE Control Systems Society Board of Governors and the European Control Association Council. He is Fellow of the IEEE and IEEE Distinguished Lecturer.