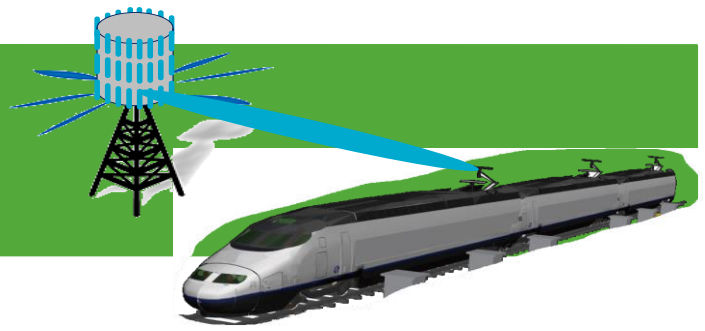# Broadband on Trains

By Prof Ren Ping Liu, CSIRO

Public Lecture
IRSE and IEEE VTS joint lecture

Date:
Thursday, 30 July 2015

Time:
Starting at 4:30pm

Location:
Mitchell Theatre,
Level 1 - 280 Pitt Street
Sydney

Cost:
All welcome - admission is free

Information:
ren.liu@csiro.au
web: irse.org.au

Abstract:

Broadband on trains aims at bringing uninterrupted mobile broadband experience into trains. However, existing cellular networks can only provide limited Internet access to fast moving trains due to a number of challenges, including large number of connections, their frequent and simultaneous handovers between passing cells, fast-changing radio channels, signal blockage in bridges and tunnels, sheltering effect of metal train carriages, and the Doppler Effect. Recently, new technologies for broadband on trains have been developed and are becoming commercially viable to provide a broad range of multimedia services, such as music and video streaming, video surveillance, video conferencing, and online gaming.

In this seminar, we will review these existing and evolving technologies, and discuss their key features and applications. In particular, we will explore future broadband-on-train technologies from two aspects. First, we investigate cellular technologies along the line of 3G-4G-5G to find out what's in store for future ground-to-train communications. Next, we will explore along the line of Wi-Fi technology development from IEEE 802.11a,b,g,n,ac,ad to Li-Fi, to discover what's in store for future business and entertainment service delivery inside train carriages.

Speaker Biography

Ren Ping Liu received his B.E. and M.E. degrees from Beijing University of Posts and Telecommunications, China, and the Ph.D. degree from the University of Newcastle, Australia. He is a Principal Scientist of networking technology in CSIRO. He is also an Adjunct Professor at Macquarie University, and University of Technology, Sydney. His research interests include MAC protocol design, Markov analysis, QoS scheduling, TCP/IP internetworking, and network security. He has over 100 research publications in leading international journals and conferences.

Professor Liu is a Senior Member of IEEE. He is the founding chair of IEEE NSW VTS Chapter. He served as TPC chair, as OC co-chair, and in Technical Committee in a number of IEEE Conferences. He has also been heavily involved in and led commercial projects delivering networking solutions to government and industry customers.

IRSE
INSTITUTION OF RAILWAY SIGNAL ENGINEERS
AUSTRALASIA

IEEE VTS
Connecting the Mobile World

IEEE