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Smart railway system (SRS)

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SRS monitors the condition of mission critical components of the railways such as wheels, axle boxes, primary suspensions of trains, rails, point machines, etc., to identify developing faults so that pre-emptive actions can be taken to avoid safety and reliability impacts to railway operations. Through the use of smart sensors such as FBG sensors, magneto-electric sensors, etc. measurement results are much more intelligent and immune to EMI than conventional electromechanical sensors. Moreover the use of a common platform would also replace the need for a dozen or so of standalone systems. SRS has been in use in the whole MTR network of Hong Kong for several years and with proven performance. It will also be installed in Singapore and Australia in the next few years. SRS has also been deployed successfully for investigational applications such as proving of structural integrity of car body, identification of high stress points in bogies, etc.

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Helmet tracking techniques using phase difference between acoustic beating envelope whose wave length is longer than audio frequency

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Helmet mounted display (HMD) has great advantages on the navigation and mission symbologies for the pilot's forward looking display and therefore has been remarkably drawing attention as the upcoming display of the next generation aircraft. The essential technology to process the line of sight-forward (LOS-F) data in real-time is to estimate exact helmet situation and position. In this paper, we research a acoustic helmet tracking technique. For the reason that mechanical acoustic noises might interfere with helmet tracking system (HTS) and unnecessary acoustic noises are inevitable when using acoustic technique, this approach has not been adapted. In order to overcome this problem, we propose that acoustic wave of which the wave length is longer than audio frequency and especially we used beating signal envelope which is composed of two close high frequencies.

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