A 1DoF Haptic Lever Device Used in Train Simulators

Elixabete Bengoechea
CEIT,
Pº de Manuel
Lardizábal, 15
20018 San Sebastián,
Spain
ebengoechea@ceit.es

Emilio Sánchez
CEIT,
TECNUN (University of Navarra)
Pº de Manuel
Lardizábal, 15
20018 San Sebastián,
Spain
esanchez@ceit.es

Jorge Juan Gil
CEIT,
TECNUN (University of Navarra)
Pº de Manuel
Lardizábal, 15
20018 San Sebastián,
Spain
jjgil@ceit.es

Abstract

Haptics is a quite new technology that can improve the way in which the user interacts with a computer and a machine. This technology is progressing quite fast. However, the number of applications in which we can find commercialized haptic devices is still very low. Maybe, this is true because the improvements of using haptic devices often are not clear. Another factor to take into account is that the price of haptics is high.

This presentation shows a real application in which a haptic device not only is recommended but also required to fulfill the customer requirements providing a reasonable low price. This application is the haptic lever used in train simulators.

In this context, haptic devices play an important role, since not only can they simulate the normal behavior of different not present mechanisms in the simulator, but they can simulate system failures as well. This work presents a multipurpose low-cost haptic 1DoF lever developed by CEIT, successfully used in a train simulator commercialized by Lander Training Simulators. A brief review of tested contact models is also presented. Finally, some experimental results are depicted and compared to a cost-effective solution, using a dSPACE.

Fig. 1. Train simulator with a 1DoF haptic lever (courtesy of Lander Simulation & Training Solutions).