SIMULATION OF HARVESTER LOGGING PROCESSING AND DYNAMIC DRIVING MOTION USING UNITY3D

Zhang Jianting[1], Huang Qingqing[1], Liu Jinhao[1], Cheng Bowen[1], Xie Danmu[1]

[1] Beijing Forestry University

Abstract: *Modern forestry equipment is characterized by high power and high energy consumption , and the working environment is in complex plantation areas , which makes it difficult to conduct production practice and cognition practice, as well as related teaching work of equipment machinery , hydraulic actuators and electronic control systems . The loggingg harvester simulator is an important infrastructure means for modern forestry characteristics of higher education. Through the demonstration and operation of the system , it can play a key role in professional cognitive teaching and mechanical , electronic and hydraulic integrated forestry equipment production internship . It is a multiplier effect for students to quickly master the advanced production methods and improve their practical ability of forestry machinery . The system is based on the actual multifunctional breeding machine control system , and is equipped with simulation visual software compatible with the input and output signals of the control system . With this system software , it can simulate mechanical operation , control system interface debugging, forest logging , hitting branches, making materials, etc. This paper focuses on the dynamic motion simulation platform sawing wood work and vehicles in Unity3D scene was simulated and experimental testing, through a single scene Unity3D wood sawing and dynamic simulation of the vehicle can be achieved anywhere, detailing for forestry equipment Key simulation techniques for job simulation and driving scene reproduction.*

1. Virtual cutting of tree model
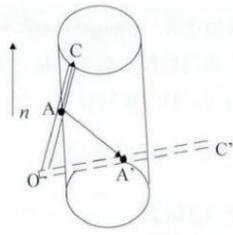
Schematic diagram of the cutting principle of the tree model

Logging simulation scene with Unity3D

2 Virtual vehicle and motion platform testing

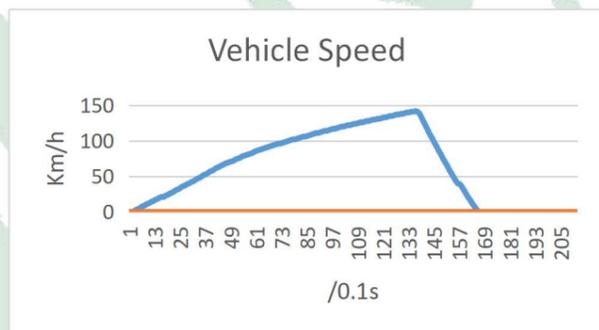### 2.1 Interaction between virtual vehicles and dynamic platforms

Stewart-Gough motion platform with MBOX control systetm

2 .2 harvester driving condition data acquisition

Simulated Driving Suit to Control a Virtual harvester
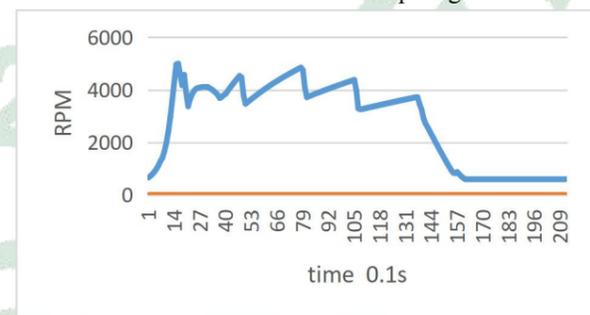
2.3 Data export and processing

car speed time diagram

acceleration time relationship diagram

engine speed time chart

2 .4   Conclusion

This chapter introduces how to use the somatosensory algorithm dynamic link library to reflect the motion posture of the virtual vehicle in real time to the six-degree-of-freedom dynamic platform driven by the M BOX control system. Use FANATEC simulated driving suit any value between 0 and 1 as a control signal for control of the virtual vehicle. Then collect the vehicle driving condition data and use the org.in2bits.MyXls library related to Excel control to write the Excel data recording and exporting program. Finally , generate the chart according to the data to be compared in the Excel table to facilitate the next research on the virtual vehicle. .