



## Uttarakhand Hams-based Automated Driver License Testing

Road safety is a major public health issue in India. According to the latest data released by Ministry of Road Transport & Highways (MoRTH) on road accidents in India during 2018, fatalities due to road accidents in India were the highest in world. As per the available data, majority of road accidents in India are caused due to Driver's fault. Therefore, ensuring good driving behavior and skill is key to improving road safety. A comprehensive, transparent, and stringent driver license testing process goes a long way in ensuring that unskilled drivers do not drive on our roads and hence promotes safety.

The Transport department of Uttarakhand, in association with Institute of Driver Training and Research (IDTR) and Microsoft Research India, took the initiative to develop an automated driver license test (ADT) system based on the state-of-the-art HAMS (Harnessing Automobile for Safety) Artificial Intelligence (AI) technology.



HAMS, can be deployed inside any four-wheeler through a smart phone, and is extremely effective in testing the driving skills of the applicants.

The ADT implemented at Dehradun is a very comprehensive system for evaluating the driving skills of driving license candidates and is able to successfully cover the majority of the desired driving skill parameters as per the Central Motor Vehicles Rules (CMVR) 1989.

The HAMS-based ADT has a number of capabilities. It ensures only right/genuine person taking the test by face verification facility thus addressing identity fraud. Automatic seat belt use detection enables safety compliance. Traffic signal violations are also automatically detected. Besides, it has the capability to evaluate the person undertaking test on the following parameters also:-



- a) Knowledge of road signs.
- b) Knowledge of road markings.
- c) Ability to validate driving correctness for standard maneuvers like S shape driving, roundabout, parking etc.
- d) Smooth driving (drive without stoppage in areas of moving traffic).
- e) Reverse parking skills.
- f) Perpendicular parking skills.
- g) Lane changing skills.
- h) Behaviour of driver inside the car while driving.
- i) Use of rear-view mirrors during driving

- j) Monitoring curve hits during driving
- k) Driving in turns and during reverse.

Upon completion of the test, the score and test outcome decision are automatically generated. In the entire driving test process, human intervention is absent.

The HAMS based ADT uses sophisticated AI algorithms which can be deployed on any smart phone to check all the above parameters of every trainee on a real time basis. The test result is generated automatically by the system, within a few minutes after the completion of the test. This ensures high efficiency and transparency.

The entire test is also recorded with pole-top cameras, providing an external view, for evidence purposes. Subsequently, a recording of the test is maintained at the testing center. The ADT at Dehradun has the capacity to test 80-90 applicants in a day.

The ADT also complies with the physical distancing norms on account of COVID-19. The applicant takes the entire license test while seated alone in the vehicle, without any evaluator/examiner, as all the parameters are checked by the Smartphone-based HAMS system.

The implementation of the HAMS-based ADT at Dehradun has brought about significant improvements in the process of issuing Driving Licenses. Some of the key highlights are:

- Successfully conducted more than 7500 (Seven thousand five hundred) tests during July'2019 to March'2020 with very high accuracy.
- Passing percentage of applicants come down from 95% (manual testing) to 55% with Automated Driving Test (ADT), reflecting the rigorous nature of automated testing.
- Consistency in ensuring identical tests and parameters for all trainees has brought fairness in the testing process.
- The above has generated very positive feedback on transparency, fairness, and comprehensiveness of the system by applicants, including those who could not pass the test.



- Apart from being much more comprehensive compared to previous testing mechanisms, the cost of implementation using the innovative HAMS technology for the ADT is 75% lower than alternatives (camera/sensor based techniques), i.e., just one-quarter the cost.

The IDTR Dehradun automated driver license test (ADT) model has been widely acknowledged as a world-class example of technology innovation by many reputed publications, both in India and across the world.

This ADT solution for driver license testing is now being replicated in other states in India such as Bihar and Haryana. There is also keen interest among entities outside India to emulate the Dehradun model for their driving test processes. HAMS-based automated driver testing at IDTR Dehradun is an excellent example of the idea of 'Make in India and offer to the world', as espoused by our Hon'ble Prime Minister.