Study on the legal status of driverless cars

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Abstract: There is still no provisions of a clear division of responsibility when a traffic accident happening with torts. Considering the development of artificial intelligence is to thrive, it's necessary that giving a legal status to driverless cars. Delimiting the scope of science and technology by law can promote the development of science and technology. However, the limitation should also be considered.

Convenience of intelligent machines benefits health care, financial services, manufacturing etc. But with wider benefit, the social risks will be tremendous if the utilization is improper. The creativity, independence, autonomy will mature and the tortious liability must exist inevitably when artificial intelligence is used in normal life. So, based on the background of the development, following questions should be answered: how AI may develop and should AI be given legal personality under specific consideration? This paper discusses the legal status of driverless cars as an example.

1. Trends in artificial intelligence

According to the speed of development of artificial intelligence, the scope and influence of it expands apparently in recent years. Therefore, I searched literatures from SCI of 2015 to 2019 based on "artificial intelligence", and got a clustering map shown in figure 1. It can be seen that a large number of researches finished. In addition to the "computing service", "deep learning", "prediction", "image", "sensitivity", and so on is still in focus. Otherwise, more and more researchers focus on deep learning.

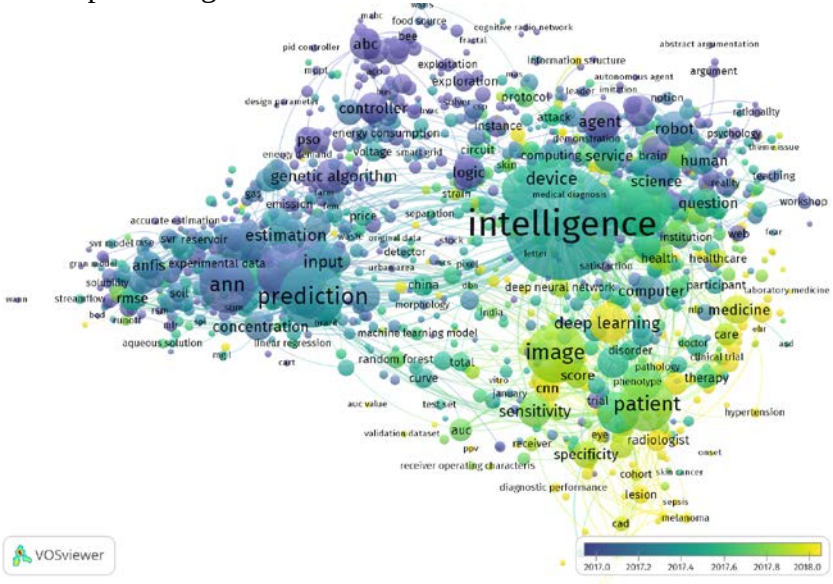

Figure 1 clustering map

Whether artificial intelligence will only be used in certain professional fields or will continue to infiltrate human life can be confirmed from the news and the emergence of various household products in recent years. It's definite that AI will not be limited to some professional fields.

What foresaid infers roughly that AI will penetrate into human life, and it's deep learning will be stronger, its autonomy, independence, interpretability unceasingly will also be strengthened.

2. The necessity of giving legal status to unmanned vehicles

2.1 The possibility of application

In an international poll on autonomous driving conducted among 5,000 respondents [1], 33% said that fully autonomous driving would be very enjoyable. Fully autonomous driving is expected to account for 50 percent of the market till 2050, according to the 69%. Thus, there is high expectations for unmanned driving.

Otherwise, some companies have produced driverless cars such as Google. And a number of technology companies and automobile factory are poring industriously. But there still no driverless cars in use for lack of relevant provisions. If unmanned driving and more AI products are to be widely used, the barrier of legal liability must be crossed [2].

2.2 The performance of deep learning generated by AI

2.2.1 Autonomy and independence

As an essential attribute of artificial intelligence, autonomy is embodied in the analysis of big data. AI has the ability to learn [3], which means that driverless car can make decisions in the face of potential traffic accidents. This "decision" is the best solution selected from a variety of solutions based on algorithms, learning from experience and analysis of factors. This is different from the self-satisfied scheme made by natural person drivers, and it may be a specific and precise decision that natural person can't predict.

2.2.2 Interpretability

Interpretability has become a new research topic with the development of deep learning. Especially, artificial intelligence systems need to be able to be explained when they participate in decision-making, namely the reasons of why do AI system offers such advice and the understanding of people affected by this decision. For unmanned vehicles, the process of logical judgment and decision making is no longer mysterious. Since the pursuit of legal responsibility for unmanned vehicles will become a reliable basis, so there is a certain supporting basis on certain legal status.

3. The limited legal status of driverless cars

In 2014, the international society of automotive engineers released a six-level classification system for self-driving cars. This paper considers that only level 3 when the autonomous driving mode is to exclude complex situations, level 4 or level 5 which means highly or fully automated can be called "unmanned driving".

In addition to the subject of natural person, laws formulate status of legal person and even unincorporated organizations. Therefore, it is not unreasonable to give them legal status when the development of unmanned vehicles is mature. [4] And This paper argues that driverless cars should be given a limited legal subject status.

There is a particularity about the infringement of unmanned driving: no natural person controls the actual driving operation system. Even if the preset algorithm is put in by the designer, it also integrates the analysis of experience and environment of the system itself.

For infringement caused by unmanned systems of, rather than for the default algorithm bias or performance failure events of infringement, the public will not understand or accept only if the final act of tort liability shall be borne by car users or designers, producers. Combined with the foregoing, the improvement of independence and interpretability not only makes it necessary to grant the subject status of unmanned driving, but also makes it possible.

Unmanned driving should have clear rights and obligations. But the liability for damages should be limited, which can be combined with the unmanned driving insurance system currently under

consideration abroad as a supporting measure. Limited legal status means limited and primary liability. The unmanned driving insurance system is also to ensure that the injured party can get certain compensation. Driverless car is not as natural person or company has a complete system of property which will not be able to satisfy the request of the victims, so part of responsibility of others is needed, thus warning the designers, producers, users to perform its duty of care and to maximize the security of driving.

4. Conclusion

Demands stimulate researches and development, but a new technology must have corresponding legal restrictions if it is applied into human life. we should not fill a hole caused in technology, but with the necessary means to predict the future trend of AI, and collect legal knowledge initiatively.

Based on the future development trend of AI, and analysis of the trends of application and research, it can be concluded that deep learning has begun to become the focus of the artificial intelligence research object, and representative unmanned intelligent robots will be more applied in the field of human life with the depth of infiltration.

In view of the legal status of unmanned vehicles, the possibility of application and the gradual improvement of the independence and interpretability of it, it is necessary to grant the subject status of unmanned vehicles. However, considering the practical operation and the role of restrictions, this paper believes that the limited legal status of unmanned vehicles is the most appropriate.

References

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