Intelligent Pattern Recognition and Applications to National Critical Needs

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White Paper Project Summary

This research is aimed at some new ideas about pattern recognition from hierarchical structures and pattern recognition points of view. In our Information Technology (IT) age, almost everything can be taken care of by computers, for minimizing manpower, time and cost. Time is money. Saving time is saving money. Every penny saved is one penny earned. Looking around the world we are living in, there are at least two major concerns that we can consider saving time, lives, and be more secure: speed up mailing systems and transportation on roads.

At the same time, we are also living in a society full of "ambiguity" phenomena, in which the same syntax can be interpreted in more than one way, including natural languages such as English, pictures such as comics, and signs such as high way directions and emergency switches. While such ambiguity phenomena are confusing and hilarious in comics, and can make people laugh for fun, many are actually critical, dangerous, unsafe, and may endanger peoples' lives.

In this research, these problems, which have been largely ignored by society for quite some time, are re-examined and new methods for solving them are proposed.

In particular, for highway road signs and emergency switches, a new idea of disambiguating technique, using the concept of similarity and distance measurement is introduced. It can detect those which are confusing and ambiguous, and correct them by disambiguating them, making them clearer and safer, thereby, making our society more secure. Further, it can ***save millions of dollars and much energy by saving millions of gallons of gasoline*** annually! Best of all, ***Precious lives saved are even more invaluable***! Security-wise, it can ***make our society safer*** in particular and the world safer in general. Environment-wise, it can also ***help keep our whole globe more clean and green***.

As it is said, "Offense is the best defense strategy", and "Prevention beforehand is always better than remedy afterwards". It is widely believed that if we had enough alert and prevention in advance, disasters like 9/11 may never happen, or at least casualties would have been much lower! Hope from this research, we all can ***learn the lesson, and be more cautious***, from ***ambiguity and IPR (Intelligent Pattern Recognition) points of view***, to ***save time, man power, energy cost, money,*** and best of all, it can ***save precious lives*****!**

This research will also open a new chapter of state-of-the-art for better understanding from ***semantic interpretation*** to ***pragmatic implementation*** of ***syntactic patterns*** and ***images***.

Keywords: intelligent pattern recognition; learning; hierarchical structures; ambiguity; similarity measurement; semantic interpretation, pragmatic implementation, syntactic patterns