

Pattern Recognition in Transportation

José Antonio Rodríguez-Serrano

Xerox Research Centre Europe
France

`jose-antonio.rodriguez@xrce.xerox.com`

Abstract. The research, development and design of Intelligent Transportation Systems worldwide relies on technologies that are able to enhance security and safety, increase efficiency, reduce congestion and promote environmental sustainability. In addition, transportation systems are becoming increasingly complex as they are required to deliver mobility to large, diverse and densely populated areas across multiple modes of transportation, e.g. cars, public transport, bicycles, electric cars, etc. Transportation systems able to cope with these challenges and scale will necessarily rely on smart sensors that monitor and act upon stimuli from the environment. Of all sensor options, visual sensors will continue to be a preferred choice since they provide data that humans can easily process and verify, e.g. it is estimated that every vehicle built after 2014 will come equipped with a rear-mounted camera.

As pattern recognition techniques mature, the demand for applications in the transportation domain will only grow. These applications range from automated vehicle detection and access control to safety systems for red-light, lane or speed management passing through traffic condition monitoring, incident detection, autonomous vehicles, etc. We will first take a look at the state-of-the-art of the different solutions with emphasis on those that present open research challenges. We will also take a look at the main trends in transportation in order to understand what research is likely to be of high relevance in future transportation systems.