

## Risk Assessment on AVs User Acceptance through Social Media Sentiment Analysis – The Drive2TheFuture project

Transport is currently becoming increasingly connected and cooperative, as well as automated, raising a number of issues about the transformation of “driver’s” role of all kinds (i.e. operator, rider, pilot, captain). Riding in an autonomous vehicle (AV) offers the opportunity to the drivers to exempt from driving tasks and engage in other leisure or productive non-driving activities, while at the same time AVs provide a new traveling option for people not able to drive conventional vehicles (i.e. persons with disabilities or the elderly), improving their mobility and independence. However, while autonomous vehicles might offer a wide range of benefits in terms of increased mobility, energy efficiency, environment improvement and safety, these benefits cannot be noticed and realised until there is a large scale of AVs market penetration, which is expected to bring a revolution to the transport system as we know it. However, it is generally suggested that the biggest barrier to this AV penetration does not concern any technology aspects (i.e. maturity), but is mostly relevant to their public acceptance issues. Even though technology is almost ready, it is a crucial issue whether people are ready to abandon the driving task and rely on a vehicle with no driver present.

Drive2theFuture project recognises the need for providing measures, tools and procedures in order to prepare “drivers”, travellers and vehicle operators of the future to accept and use connected, cooperative and automated transport modes and the industry of these technologies to understand and meet their needs and wants. One of the main aspects of the Drive2theFuture project is to also explore and recognise factors affecting users’ acceptance of autonomous vehicles. In this context, key risks to user acceptance of AVs will be assessed during the project by experts in two phases: ***a priori on expected risks***, using the FMEA methodology and ***a posteriori based also on a social media sentiment analysis***. This paper focuses on the description of the methodology that will be applied for the sentiment analysis, in relation to the risk assessment of the AVs public acceptance, which aims to identify user fears and concerns and propose mitigation measures to increase awareness and promote user acceptance. For this to be achieved, a combination of qualitative and quantitative methods will be used, based on a list of lexical features that have been firstly constructed and empirically validated, while they will be also combined with general rules that embody grammatical and syntactical conventions for expressing and emphasizing sentiment intensity. This analysis is currently being performed over data readily available through relevant APIs, such as the Twitter API, that allows the extraction of content based on specific queries.