THE CERTAINTY PRINCIPLE

SMART CITIES ARE GOING TO NEED AUTOMATED 'SPEED LIMITS AS A SERVICE'. BUT TO OFFER 'SLAAS' REQUIRES KNOWING EXACTLY WHERE A VEHICLE IS, HOW FAST IT IS MOVING AND WHERE. JEAN-PAUL VAN DE VEN AND MARCUS JENKINS EXPLAIN HOW THEY MADE THIS A REALITY

Today, we assume that the GPS signal will give you a true representation of your location – and to a large extent that is the case. But as with every sensor, there is a margin of error.

To establish if a driver has exceeded the speed limit, the easiest way is to check the speed of the GPS device against a geographic database that includes the speed limit for that road. In many cases the correct answer will be returned – but not always.

For example, to ascertain which road a vehicle is driving on, it is typical to 'snap' the GPS position to the nearest road. However, the nearest road to the reported GPS position could be a country lane with a 30mph speed limit crossing underneath the road you are travelling on. The road the vehicle is travelling on has a speed limit of 60mph. The vehicle is travelling at 55mph, but the system records a speeding offence of 25mph, almost double the legal speed limit, setting off alarm bells.

By including the heading information of the GPS unit, it is easy to detect that the vehicle was not travelling on the 30mph country road, and for many applications, such as checking if your drivers regularly exceed speed limits, this will work. But for applications such as insurance telematics, where this information can be used to determine the driver's premium, this is still not good enough. There are still situations that can return the wrong speed limit as a result of a GPS position 'snapping' to a wrong road, such as a parallel road, or if a vehicle changes direction quickly or is in the wrong place at the wrong time.

Wireless Logic wanted to offer its customers a solution to this. It selected Rebennu, a company specialised in LBS. The project brief was to provide 'speed limits as a service'. After some initial testing, Rebennu realised that it was easy to get it right some of the time with some basic techniques, but to get it right almost all the time was a different matter. Following months of additional testing and development, it was clear that sophisticated algorithms were needed. Rebennu found a novel solution to the problem, based on analysing the GPS track to match points to the road geometry using a physics model of the vehicle. Dependent on the match, detailed further analysis is performed to fit the GPS track to the routing graph of the map database.

The data and maps used are based on the HERE platform, which contains information on real-world posted speed limits for the whole of Europe, US and several other countries. If you are interested in a demo please contact the authors or visit www.wirelesslogic.com/heredemo/

There is an expectation that every facet of our digital lives should benefit from pinpoint accuracy. As technology becomes further integrated into our lives, it is important that this expectation become a reality. In this application, we have devised a solution that puts an end to the ambiguity that used to exist when trying to determine a driver's speed. And that's good for safety, insurance premiums and, of course the drivers being tracked.

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Jean-Paul van de Ven and Marcus Jenkins are the co-founders of Rebennu (www.rebennu.com)

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