Using Real Truck Tours Feedback for Address Geocoding Correction

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Abstract : When researchers or logistics software developers deal with vehicle routing optimization, they mainly focus on minimizing the total travelled distance or the total time spent in the tours by the trucks, and maximizing the number of visited customers. They assume that the upstream real data given to carry the optimization of a transporter tours is free from errors, like customers' real constraints, customers' addresses and their GPS-coordinates. However, in real transporter situations, upstream data is often of bad quality because of address geocoding errors and the irrelevance of received addresses from the EDI (Electronic Data Interchange). In fact, geocoders are not exempt from errors and could give impertinent GPS-coordinates. Also, even with a good geocoding, an inaccurate address can lead to a bad geocoding. For instance, when the geocoder has trouble with geocoding an address, it returns those of the center of the city. As well, an obvious geocoding issue is that the mappings used by the geocoders are not regularly updated. Thus, new buildings could not exist on maps until the next update. Even so, trying to optimize tours with impertinent customers GPS-coordinates, which are the most important and basic input data to take into account for solving a vehicle routing problem, is not really useful and will lead to a bad and incoherent solution tours because the locations of the customers used for the optimization are very different from their real positions. Our work is supported by a logistics software editor Tedies and a transport company Upsilon. We work with Upsilon's truck routes data to carry our experiments. In fact, these trucks are equipped with TOMTOM GPSs that continuously save their tours data (positions, speeds, tachograph-information, etc.). We, then, retrieve these data to extract the real truck routes to work with. The aim of this work is to use the experience of the driver and the feedback of the real truck tours to validate GPS-coordinates of well geocoded addresses, and bring a correction to the badly geocoded addresses. Thereby, when a vehicle makes its tour, for each visited customer, the vehicle might have trouble with finding this customer's address at most once. In other words, the vehicle would be wrong at most once for each customer's address. Our method significantly improves the quality of the geocoding. Hence, we achieve to automatically correct an average of 70% of GPS-coordinates of a tour addresses. The rest of the GPS-coordinates are corrected in a manual way by giving the user indications to help him to correct them. This study shows the importance of taking into account the feedback of the trucks to gradually correct address geocoding errors. Indeed, the accuracy of customer's address and its GPS-coordinates play a major role in tours optimization. Unfortunately, address writing errors are very frequent. This feedback is naturally and usually taken into account by transporters (by asking drivers, calling customers...), to learn about their tours and bring corrections to the upcoming tours. Hence, we develop a method to do a big part of that automatically.

Keywords : driver experience feedback, geocoding correction, real truck tours