A Carpooling Open Application
with Social Oriented Reward Mechanism

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Abstract. Carpooling is currently getting more and more attractive thanks both to an increasing emphasis placed on environmental issues and to the huge use of web based social networks. They indeed (1) allow to spread all information for an effective service (2) compensate the lack of confidence among carpooling users (3) promote carpooling companies via viral marketing (4) act as a basis for trust based users recommendation system. CORSA is an open source solution for a real time ride sharing (RTRS) carpooling service, with high accessibility, high usability, and effectiveness and efficiency in finding a riding solution for users. This proposal also endorses the role of social networks using a virtual credits reward mechanism.

Keywords: carpooling, RTRS, ride sharing, social networks virtual credits.

1 Introduction

The transport system based on sharing private cars, simply known as carpooling is an innovative yet quite old idea whose first proposals date back to more than thirty years ago [10] [22]. The renewal of the interest for carpooling is due to the increasing emphasis placed on the reduction in the number of vehicles, the expenses for gas and in energy consumption and pollution.

An additional factor that is encouraging the intensive adoption of carpooling comes from the massive use of web based social networks [12] [20]. They indeed represent a well-established tool:

– to share all information for an effective carpooling service (users personal profiles, ongoing position, preferred routes etc.)
– to leverage social relationships to remedy the lack of confidence among users that currently limits the use of carpooling,
– to encompass the traditional forms of marketing and advertising for instance endorsing carpooling companies by viral marketing [9]
– to provide feedback mechanisms as users/service rating and recommendation useful to build an overlay trust network [4] that can consolidate the relationship of carpooling users [8] and allow to safely add new users, e.g. persons could choose only trusted people for sharing their routes [5].
to exploit hidden relationships, for instance if a community of people that lives
and/or work at close places is discovered [3], the system can put them into contact
for sharing common routes

The work presented in this paper, named CORSA (Carpooling Open source Ride
Sharing Application) [17], is a solution for a carpooling service accessible anytime
from anywhere with high usability, effectiveness and efficiency in automatically pro-
viding users with helpful solutions. In addition to these features, in our proposal we
also endorse the role of social networks. Indeed, we reward users with virtual credits to
promote carpooling and to spend such credits, an ecosystem of business or public insti-
tutions affiliated with the platform is needed; for this mechanism to be successful, we
push users to publicize it to their friends belonging to the same social network acting
as in a competition where the greater score you earn, the more credits you can spend on
the platform, according to the viral marketing paradigm [16].

To exploit social networks from the very beginning, the initial set of users involved in
the testing phase consists of students attending the same university, so a (possibly strong
connected) virtual social network is already present. Finally, the work was developed
using only open sources libraries, to spread its adoption.

The paper is organized as follows. In section 2 we briefly compare our approach with
others, whereas in section 3 the application model and its architecture are discussed. In
section 4 we introduce some use cases to show how the application works, providing
concluding remarks and future works in section 5.

2 Related Work

In literature, two carpooling services exist, the Daily Car Pooling Problem [11], where
each day a number of users declare their availability for picking up colleagues, and the
Long-term Car Pooling Problem, where the goal is to define pools where each user will
(in turn) pick up the remaining pool members on different days [19]. Our proposal falls
into the former, in particular belongs to the so-called real time ride sharing (or RTRS)
family problems [15] [13] [11], where trips are planned just before they occur.

Considering other (even commercial) solutions, there are several characteristics that
differentiate RTRS platforms: user registration and management, with special attention
to drivers; payment methods; Gamification mechanisms to encourage the usage of the
service; feedback and ranking system to manage trust and reputation of users; route
management, in particular pick up and dropoff points of passengers.

Six companies are taken into consideration: Lyft [18], Uber [24], SideCar [21],
Wingz [25], BlaBlaCar [2] and Carma [6]. The first four offer services comparable to
the ones of a taxi in which passengers contact drivers asking to dropped off in a certain
destination. Registered users can become drivers if they successfully pass the companys
approval process and meet security requirements such as: no criminal record, minimum
age 23 years old, at least three years of driving, a car that meets specific safety stan-
dards, no DUI. In addition, all drivers must have insurance coverage. The remaining
companies, BlaBlaCar and Carma, are traditional carpooling, where drivers actually
share their car for journeys they are doing. In all six cases, passenger pay a monetary
compensation for the service. In the case of BlaBlaCar the payment is made in cash, in