AUTO CAR CONNECT
LICENCE PLAT BASED CONTACT DRIVER SYSTEM

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ABSTRACT
The paper presents an innovative car social network service that allows getting in touch with a driver through his individual identification based on the car license plate. The Car Social Network architecture is based on a unified cloud communication platform that enables the activation of multimedia communication sessions with the car driver.The application contexts range from road safety to the reduction of noise pollution in cities.

INTRODUCTION
Road traffic often turns out to be a problem due to the disconcerting habits and behaviors of many motorists. This problem also causes noise pollution (e.g. cars obstructing passage of other vehicles) and there is no solution other than the search for the owner of the vehicle nearby. Car Social Network is a distributed platform for Cloud applications that allows you to contact, via SMS message, a simple email or telephone call[1]-[5], the owner of a car, based exclusively on the car license plate number. The platform is useful for communications relating to the management of road traffic, the reduction in noise pollution, road safety (targeted alerts of critical issues in the vicinity), or for recreational purposes. Thanks to innovative sensors, through the Car Social Network service a driver could be warned to be careful for an imminent risk of aquaplaning, or flooding of an underpass, get detailed information on motorway traffic and be warned in real-time of any accidents, obtain information on the identity of the driver [14] or on his state of health.

LITERATURE SURVEY
With the adoption of state-of-the-art telecommunication technologies for sensing and collecting traffic related information, Vehicular Sensor Networks (VSNs) [6] have emerged as a new application scenario that is envisioned to revolutionize the human driving experiences and traffic flow control systems. To avoid any possible malicious attack and resource abuse, employing a digital signature scheme is widely recognized as the most effective approach for VSNs to achieve authentication, integrity, and validity. However, when the number of signatures received by a Roadside Unit (RSU) becomes large, a scalability problem emerges immediately, where the RSU could be difficult to sequentially verify each received signature within 300 ms interval according to the current Dedicated Short Range Communications [7] (DSRC) broadcast protocol. We introduce an efficient batch signature verification scheme for communications between vehicles and RSUs (or termed vehicle- to-Infrastructure (V2I) communications), in which an RSU can verify multiple received signatures at the same time such that the total verification time can be dramatically reduced. We demonstrate that the proposed scheme can achieve conditional privacy preservation that is essential in VSNs [8], where each message launched by a vehicle is mapped to a distinct pseudo identity, while a trust authority can always retrieve the real identity of a vehicle from any pseudo identity. With the proposed scheme, since identity-based

cryptography is employed in generating private keys for pseudo [9] identities, certificates are not needed and thus transmission overhead can be significantly reduced.
Social sensing has emerged as a new sensing paradigm to observe the physical world by exploring the "wisdom of crowd" on social media. This paper focuses on the abnormal traffic event localization problem using social media sensing. Two critical challenges exist in the state-of-the-arts: i) "content-only inference": the limited and unstructured content of a social media post provides little clue to accurately infer the locations of the reported traffic events; ii) "informal and scarce data": the language of the social media post (e.g., tweet) is informal and the number of the posts that report the abnormal traffic events is often quite small. To address the above challenges, we develop SyntaxLoc, a syntax-based probabilistic learning framework to accurately identify the location entities by exploring the syntax of social media content. We perform extensive experiments to evaluate the SyntaxLoc[10] framework through real world case studies in both New York City and Los Angeles. Evaluation results demonstrate significant performance gains of the SyntaxLoc framework over state-of-the-art baselines in terms of accurately identifying the location entities that can be directly used to locate the abnormal traffic events.
This paper focuses on the migratable traffic risk estimation problem in intelligent transportation systems using the social (human-centric) [12] sensing. The goal is to accurately estimate the traffic risk of a target area where the ground truth traffic accident reports are not available by leveraging an estimation model from a source area where such data is available. Two important challenges exist. The first challenge lies in the discrepancy between source and target areas (e.g., layouts, road conditions, and local regulations) and such discrepancy would prevent a direct application of a model from the source area to the target area. The second challenge lies in the difficulty of identifying all potential features in the migratable traffic risk estimation problem and decide the importance of identified features due to the lack of ground truth labels in the target area. To address these challenges, we develop DeepRisk [11], a social sensing based migratable traffic risk estimation scheme using deep transfer learning techniques. The evaluation results on a real world dataset in New York City show the DeepRisk significantly outperforms the state-of-the-art baselines in accurately estimating the traffic risk of locations in a city.
One of the most exciting application areas of wireless ad hoc networks is the automobile sector. Ad hoc network technology will be used in the near future in the car's onboard communication unit in order to collect real-time data on traffic and road conditions from a variety of onboard sensors. Areas of application include services like safety warning systems, traffic control, and real-time traffic re-routing by intelligent traffic management systems. In this paper unique features and challenges that distinguish these systems from other types of ad hoc sensor networks will be discussed. We will also consider possible applications of wireless Grids [12] in addressing the data aggregation and processing challenges that ubiquitous traffic monitoring and management systems will face. Some of the discussion will be based on our own experience with an ongoing collaborative project at BT Research in the area of Ubiquitous Traffic Telematics (Traffimatics).
Vehicular sensor networks are emerging as a new network paradigm of primary relevance, especially for proactively gathering monitoring information in urban environments. Vehicles typically have no strict constraints on processing power and storage capabilities. They can sense events (e.g., imaging from streets), process sensed data [13] (e.g., recognizing license plates), and route messages to other vehicles (e.g., diffusing relevant notification to drivers or police agents). In this novel and challenging mobile environment, sensors can generate a sheer amount of data, and traditional sensor network approaches for data reporting become unfeasible. This article proposes MobEyes, an efficient lightweight support for proactive urban monitoring based on the primary idea of exploiting vehicle mobility to opportunistically diffuse summaries about sensed data. The reported experimental/analytic results show that MobEyes

[14] can harvest summaries and build a low-cost distributed index with reasonable completeness, good scalability, and limited overhead
Traffic monitoring in urban transportation systems can be carried out based on vehicular sensor networks. Probe vehicles (PVs), such as taxis and buses, and floating cars (FCs), such as patrol cars for surveillance, can act as mobile sensors for sensing the urban traffic and send the reports to a traffic-monitoring center (TMC) [15]for traffic estimation. In the TMC, sensing reports are aggregated to form a traffic matrix, which is used to extract traffic information. Since the sensing vehicles cannot cover all the roads all the time, the TMC needs to estimate the unsampled data in the traffic matrix. As this matrix can be approximated to be of low rank, matrix completion (MC) is an effective method to estimate the unsampled data. However, our previous analysis on the real traces of taxis in Shanghai reveals that MC [16] methods do not work well due to the uneven samples of PVs, which is common in urban traffic. To exploit the intrinsic relationship between the unevenness of samples and traffic estimation error, we study the temporal and spatial entropies of samples and successfully define the important criterion, i.e., average entropy of the sampling process. A new sampling rule based on this relationship is proposed to improve the performance of estimation and monitoring. With the sampling rule, two new patrol algorithms are introduced to plan the paths of controllable FCs [17] to proactively participate in traffic monitoring. By utilizing the patrol algorithms for real-data-set analysis, the estimation error reduces from 35% to about 10%, compared with the random patrol or interpolation method in traffic estimation. Both the validity of the exploited relationship and the effectiveness of the proposed patrol control algorithms are demonstrated.
With the ever-increasing number of road traffic accidents worldwide, the road traffic safety has become a critical problem in intelligent transportation systems. A key step towards improving the road traffic safety is to identify the locations where severe traffic accidents happen with a high probability so the precautions can be applied effectively. We refer to this problem as risky traffic location identification. While previous efforts have been made to address similar problems, two important [18] limitations exist: i) data availability: many cities (especially in developing countries) do not maintain a publicly accessible database for the traffic accident records in a city, which makes it difficult to accurately estimate the accidents in the city; ii) location accuracy: many self-reported traffic accidents (e.g., social media posts from common citizens) are not associated with the exact GPS locations due to the privacy concerns. To address these limitations, this paper develops the RiskSens[19], a multi-view learning approach to identifying the risky traffic locations in a city by jointly exploring the social and remote sensing data. We evaluate RiskSens using a real world dataset from New York. The evaluation results show that RiskSens significantly outperforms the state-of-the- art baselines in identifying risky traffic locations in a city.
While autonomous unmanned aerial vehicles (UAVs) [20] have attained a reputable stance in modern disaster response applications, their practical adoptions are impeded due to various constraints (e.g., requiring manual input, battery life). In this paper, we develop a novel spatiotemporal aware drone sensing system that is driven by harnessing social media signals, a process known as social sensing. Social sensing has emerged as a new sensing paradigm where humans act as "sensors" to report their observations about the physical world. However, maneuvering drones with "social signals" introduces a new realm of challenges. The first challenge is to drive the drones by leveraging noisy and unreliable social media signals. The second challenge is to optimize the drone deployment by exploring the highly dynamic and latent correlations among event locations. In this paper, we present CollabDrone [21] that devises a new spatiotemporal correlation inference model and game-theoretic drone dispatching mechanism to address the above challenges. The evaluation results on a real-world case study show that

CollabDrone significantly outperforms current drone and social sensing baselines in terms of accuracy and deadline hit rate.

We present a route planning technique solely based on the concept of node *contraction*. The nodes are first ordered by 'importance'. A hierarchy is then generated by iteratively *contracting* the least important node. Contracting [22] a node *v* means replacing shortest paths going through *v* by *shortcuts*. We obtain a hierarchical query algorithm using bidirectional shortest-path search. The forward search uses only edges leading to more important nodes and the backward search uses only edges coming from more important nodes. For fastest routes in road networks, the graph remains very sparse throughout the contraction process using rather simple heuristics for ordering the nodes. We have five times lower query times than the best previous hierarchical Dijkstra-based speedup techniques and a *negative* space overhead, i.e., the data structure for distance computation needs *less* space than the input graph. CHs can be combined with many other route planning techniques, leading to improved performance for many-to-many routing, transit-node routing, goal-directed routing or mobile and dynamic scenarios.

Vehicular sensor networks are an emerging network paradigm, suitable for various applications in vehicular environment making use of vehicles' sensors as data sources[23] and Inter-Vehicle Communication systems for the transmissions. We present a solution, based on vehicular sensor networks, for gathering data from a certain geographic area while satisfying with a specific delay bound. The method leverages the time interval during which the query is active in order to make the gathering process efficient, properly alternating data muling and multi-hop forwarding strategies like in delay-bounded routing protocols. Simulations show that our proposed solution succeeds in performing efficient data gathering outperforming other solutions.

PROBLEM STATEMENT

The worldwide diffusion of autonomous vehicles is currently attracting much attention concerning the new services and innovative applications for roadways.

However, considering various devices that are not physically connected, it is possible to highlight an effective smart ecosystem or environment characterized not only by the platform or pavement physically supporting the vehicle.

Hence, such an environment, defined as SRE [24](Smart Road Environment), is composed mainly of the following systems:

Real time monitoring; Analysis and accounting of users' behavior; Route planner; Intelligent road lights and signals;Parking and loading areas;Sensors; ITS (Intelligent Transport Systems).

PROPOSED SYSTEM

In a plate recognition system is proposed through the "Plate" object, subsequently, the segmentation phase is carried out to divide the plate area into particular positions for the detection of numbers and letters. The last step is the recognition of each region segmented in numbers and letters to read the license plate. This process is done with a single-class sliding window detector using small YOLO CNN [25] classifiers.

A segmentation based on optimal K-means clustering (OKM) and convolutional neural network (CNN), called OKM-CNN [26] , for license plate recognition is proposed in. The proposed OKM-CNN model operates in three main stages: license plate detection (LP), segmentation using the OKM clustering technique, and license plate recognition using the CNN model. The classification accuracy is approximately 98%.

SYSTEM IMPLEMENTATION

The web platform integrates screens for: Registration, entering your personal data, deciding whether to show them during the search, and choosing how one wants to be contacted; Search for the driver by license plate number; Show the data and the method of contacting the driver. The vehicle registration page, allows entering the driver's data, car license plate, email and telephone number
Finally, you can choose whether you want to be contacted by: Email; Voice call;Text Message (SMS).
The search page allows you to enter the car license plate number and use the "Search" button to search among the data of the drivers registered in the MongoDB data storage. After the search, if successful, the owner of the vehicle and the methods he has chosen to be contacted.
In the event that the user, who wants to get in touch with the car owner, chooses the "SMS" or "email" mode, it will be possible to select the message content from a set of pre-configured messages, The same applies if the "voice call" mode is chosen; in such case, the platform will contact the car owner by telephone and reproduce the message content via a TTS synthesis engine.

SYSTEM ARCHITECTURE

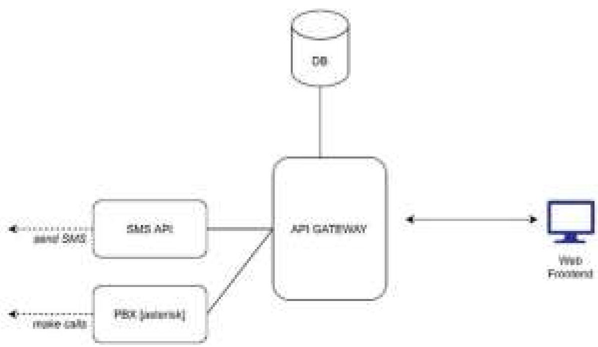
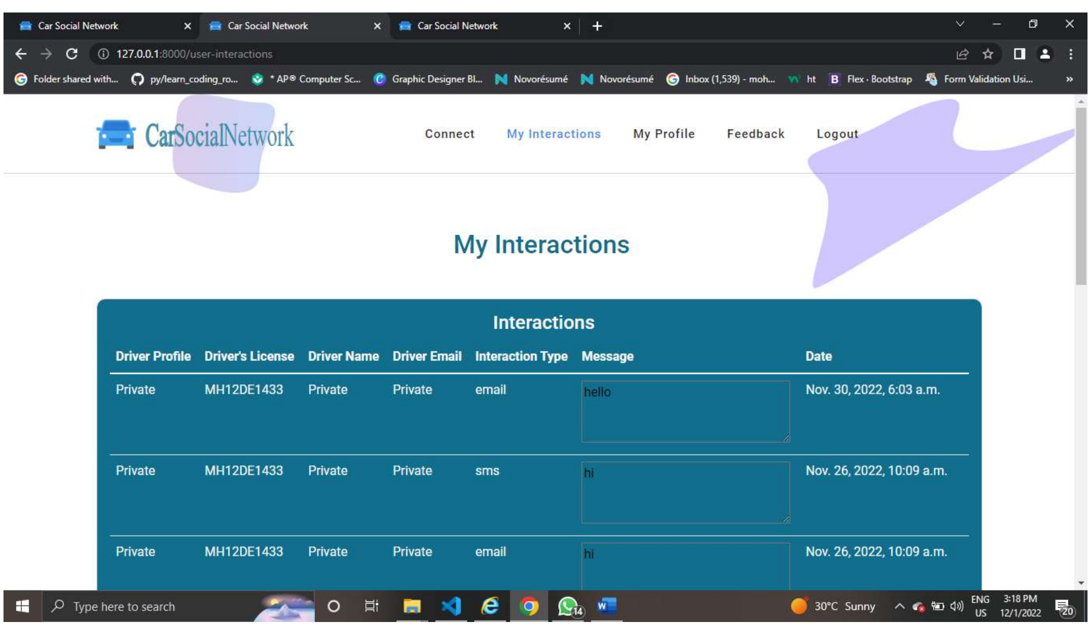
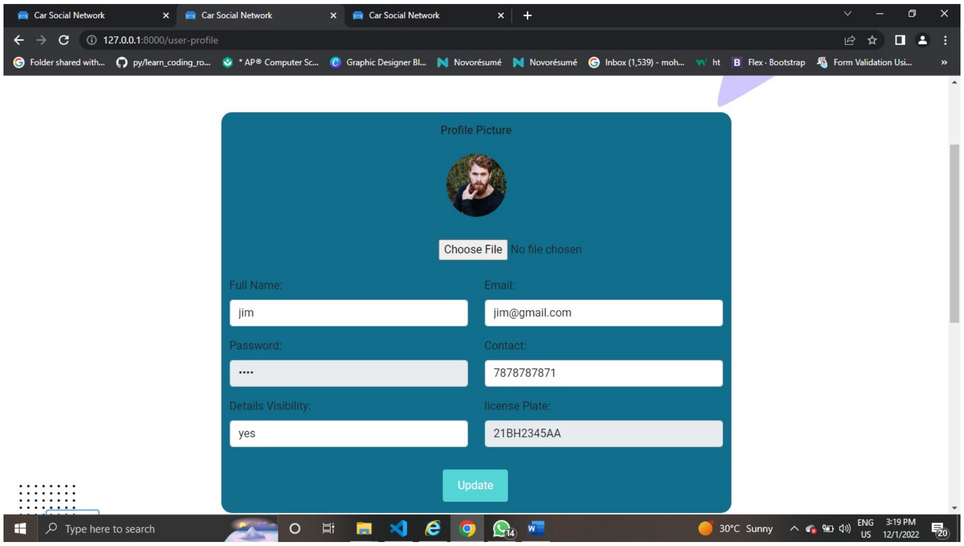


Figure 1. Car Connect Architecture.

OUTPUT RESULTS

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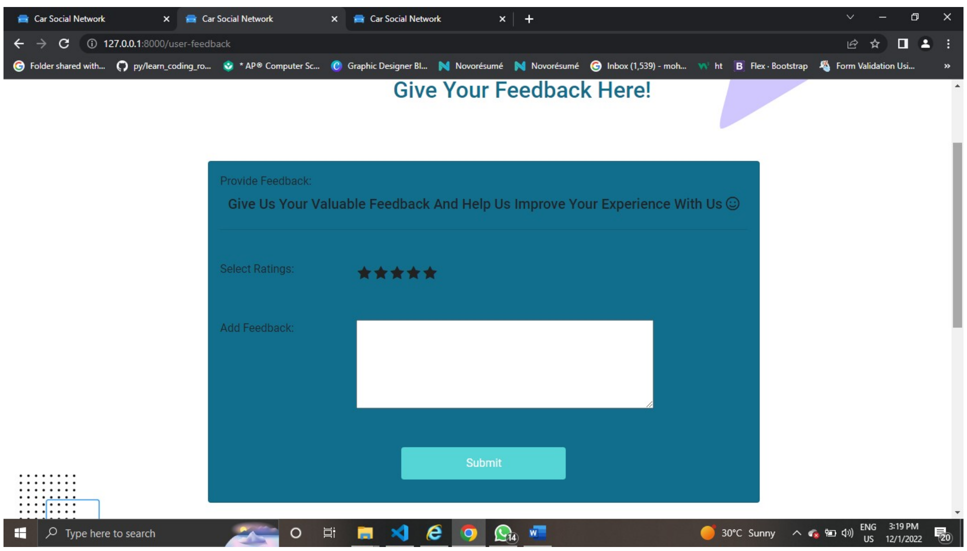
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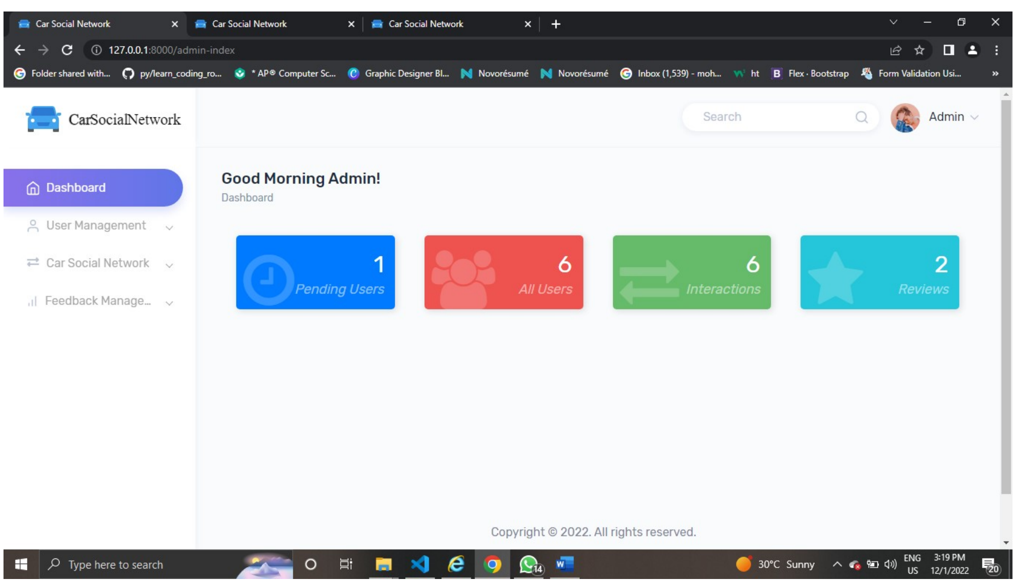
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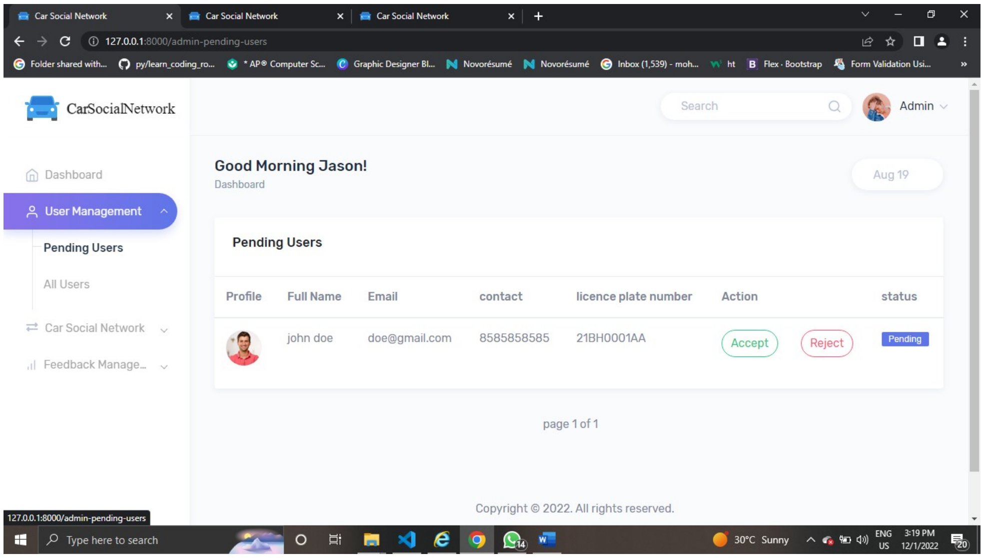
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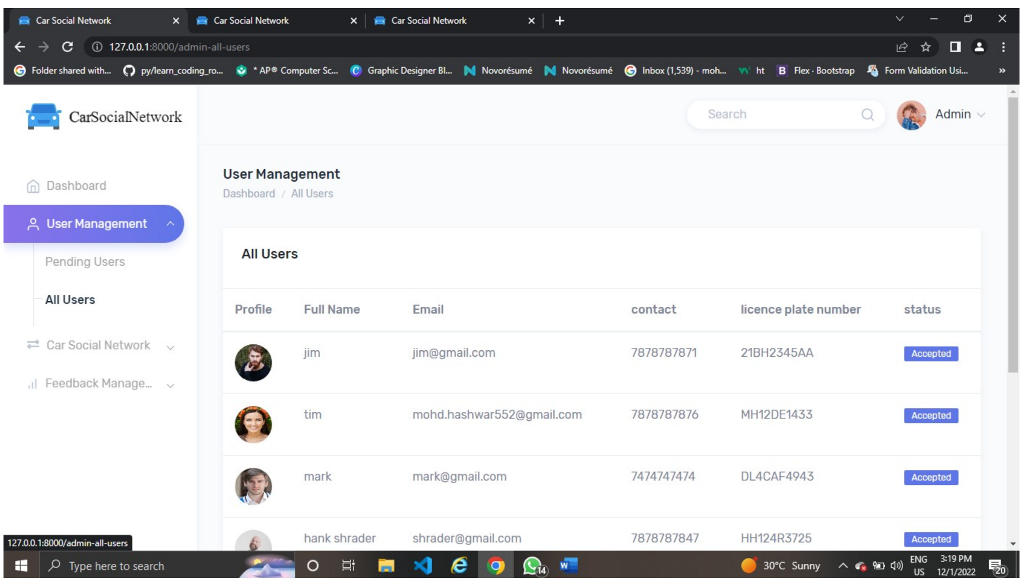
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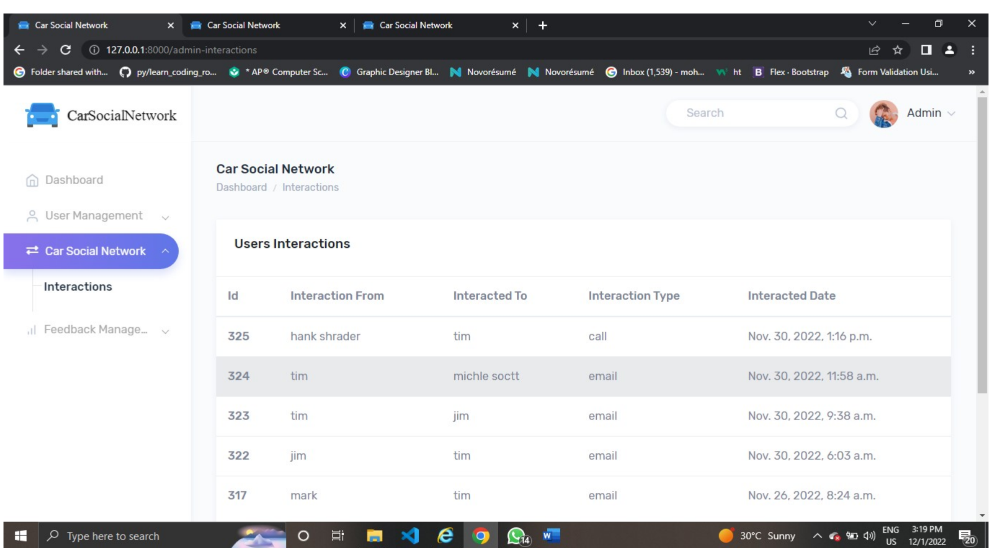
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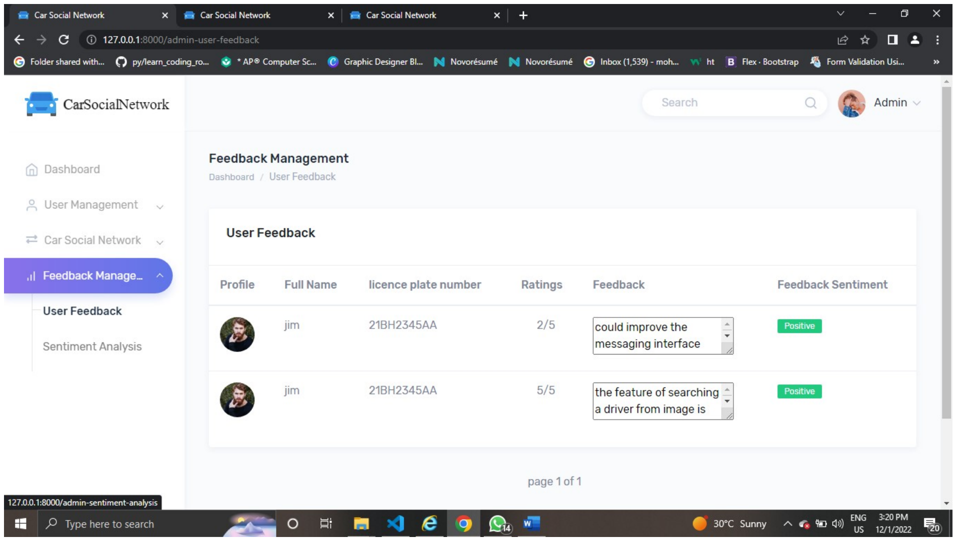

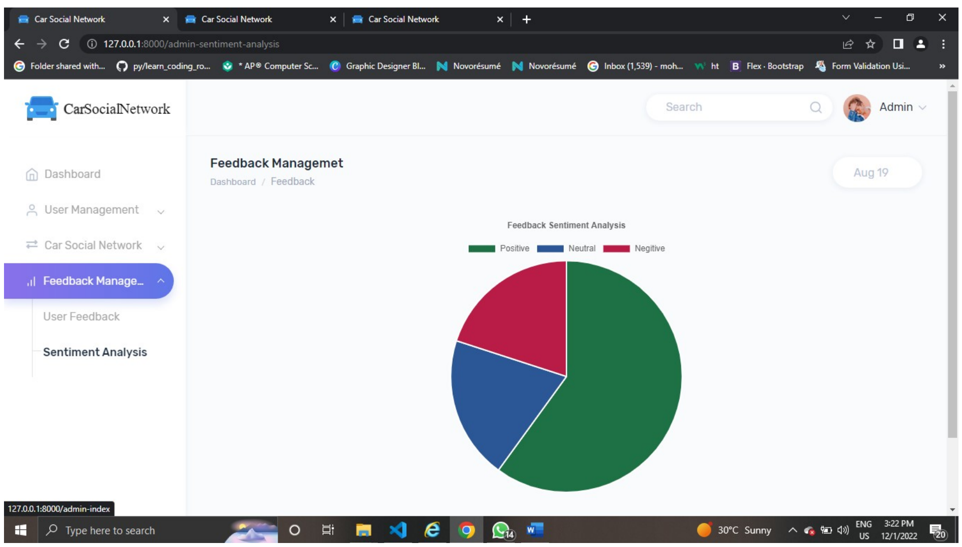

CONCLUSION

The paper proposes an innovative service based on a cloud as a service platform. The Car Social Network service exploits the two-way correspondence between the car owner and the license plate number which becomes the identification code in the call set up phases enabling communication with the owner (even more than one via a list). The ability to contact a person via the license plate number through a unified communication App allows the implementation of countless useful services in various contexts including road safety and the reduction of noise pollution. Finally, the Car-Social Network platform has been developed respecting the privacy of car owners, as it does not make the vehicle owner's data public.

REFERENCES

[1] C. Zhang, R. Lu, X. Lin, P. -. Ho, and X. Shen, "An Efficient Identity-Based Batch Verification Scheme for Vehicular Sensor Networks," IEEE INFOCOM 2008 - The 27th Conference on Computer Communications, 2008, pp. 246-250.

[2] Y. Zhang, X. Dong, D. Zhang, and D. Wang, "A Syntax-based Learning Approach to Geo-locating Abnormal Traffic Events using Social Sensing," in 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), 2019, pp. 663-670.

[3] Y. Zhang, H. Wang, D. Zhang, and D. Wang, "Deeprisk: A deep transfer learning approach to migratable traffic risk estimation in intelligent transportation using social sensing," in 2019 15th International Conference on Distributed Computing in Sensor Systems (DCOSS), 2019, pp. 123–130.

[4] M. Nekovee, "Sensor networks on the road: the promises and challenges of vehicular ad hoc networks and grids," in Workshop on ubiquitous computing and e-Research, vol. 47, 2005.

[5] U. Lee, B. Zhou, M. Gerla, E. Magistretti, P. Bellavista, and A. Corradi, "Mobeyes: smart mobs for urban monitoring with a vehicular sensor network," in IEEE Wireless Communications, vol. 13, no. 5, pp. 52-57, October 2006.

[6] R. Du, C. Chen, B. Yang, N. Lu, X. Guan, and X. Shen, "Effective Urban Traffic Monitoring by Vehicular Sensor Networks," in IEEE Transactions on Vehicular Technology, vol. 64, no. 1, pp. 273-286, Jan. 2015.

[7] Y. Zhang, Y. Lu, D. Zhang, L. Shang, and D. Wang, "RiskSens: A Multi-view Learning Approach to Identifying Risky Traffic Locations in Intelligent Transportation Systems Using Social and Remote Sensing," in 2018 IEEE International Conference on Big Data (Big Data), 2018, pp. 1544-1553.

[8] M. T. Rashid, D. Zhang, Z. Liu, H. Lin, and D. Wang, "CollabDrone: A Collaborative Spatiotemporal-Aware Drone Sensing System Driven by Social Sensing Signals," in 2019 28th International Conference on Computer Communication and Networks (ICCCN), 2019, pp. 1-9.

[9] R. Geisberger, P. Sanders, D. Schultes, and D. Delling, "Contraction hierarchies: Faster and simpler hierarchical routing in road networks," in International Workshop on Experimental and Efficient Algorithms, Springer, Berlin, Heidelberg, 2008, pp. 319–333.

[10] C. E. Palazzi, F. Pezzoni, and P. M. Ruiz, "Delay-bounded data gathering in urban vehicular sensor networks," in Pervasive and Mobile Computing, vol. 8, no. 2, pp. 180–193, 2012.

[11] H. Gong, L. Yu, and X. Zhang, "Social contribution-based routing protocol for vehicular network with selfish nodes," in International Journal of Distributed Sensor Networks, vol. 10, no. 4, pp. 753024, 2014.

[12] R. Avanzato, F. Beritelli, F. Di Franco and V. F. Puglisi, "A Convolutional Neural Networks Approach to Audio Classification for Rainfall Estimation," in 2019 10th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS), 2019, pp. 285-289.

[13] R. Avanzato and F. Beritelli, "Hydrogeological Risk Management in Smart Cities: A New Approach to Rainfall Classification Based on LTE Cell Selection Parameters," in IEEE Access, vol. 8, pp. 137161-137173, 2020.

[14] F. Beritelli and A. Spadaccini, "A Statistical Approach to Biometric Identity Verification Based on Heart Sounds," in 2010 Fourth International Conference on Emerging Security Information, Systems and Technologies, 2010, pp. 93-96.

[15] G. Karagiannis et al., "Vehicular Networking: A Survey and Tutorial on Requirements, Architectures, Challenges, Standards and Solutions," in IEEE Communications Surveys & Tutorials, vol. 13, no. 4, pp. 584-616, 2011.

[16] J. Jaehoon, et al. "A comprehensive survey on vehicular networks for smart roads: A focus on IP-based approaches." in Vehicular Communications, vol. 29, pp. 100334, 2021.
[17] S. Trubia, A. Severino, S. Curto, F. Arena, and G. Pau, “Smart Roads: An Overview of What Future Mobility Will Look Like,” in Infrastructures, vol. 5, no. 12, pp. 107, 2020.
[18] B. Großwindhager, et al., “Dependable internet of things for networked cars,” in International Journal of Computing, vol. 16, no. 4, pp.226-237, 2017.
[19] N.D.V. Dalarmelina, M.A. Teixeira, and R.I. Meneguette, “A real-time automatic plate recognition system based on optical character recognition and wireless sensor networks for ITS,” in Sensors, vol. 20, no. 1, p.55, 2020.
[20] M. Z. Abedin, A. C. Nath, P. Dhar, K. Deb and M. S. Hossain, "License plate recognition system based on contour properties and deep learning model," 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC), 2017, pp. 590-593, doi: 10.1109/R10-HTC.2017.8289029.
[21] C. N. E. Anagnostopoulos, I. E. Anagnostopoulos, V. Loumos and E. Kayafas, "A License Plate-Recognition Algorithm for Intelligent Transportation System Applications," in IEEE Transactions on Intelligent Transportation Systems, vol. 7, no. 3, pp. 377-392, Sept. 2006, doi: 10.1109/TITS.2006.880641.
[22] R.C. Chen, “Automatic License Plate Recognition via slidingwindow darknet-YOLO deep learning,” in Image and Vision Computing, vol. 87, pp.47-56, 2019.
[23] I. V. Pustokhina et al., "Automatic Vehicle License Plate Recognition Using Optimal K-Means With Convolutional Neural Network for Intelligent Transportation Systems," in IEEE Access, vol. 8, pp. 92907-92917, 2020.
[24] H. Ahn and H.J. Cho, “Research of automatic recognition of car license plates based on deep learning for convergence traffic control system,” in Personal and Ubiquitous Computing, pp.1-10, 2021.
[25] S. M. Silva and C. R. Jung, "A Flexible Approach for Automatic License Plate Recognition in Unconstrained Scenarios," in IEEE Transactions on Intelligent Transportation Systems, pp. 1-11, 2021.
[26] G. Stamatescu, I. Fgran, and A. Sachenko, “Sensing and datadriven control for smart building and smart city systems,” in HidawiJurnal of Sensors, vol. 2019, Article ID 4528034, 3 pages.

