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ANSH: AI Powered Analyzing Routes And Navigate Safe Drive Helper

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Abstract:

As we can observe there are many uncertainty we phase while driving and somehow we also get part of accident or some other difficulties where our familiar are unable navigate thus ANSH works as a third eye which track upcoming difficulties in road side like crowded animals , some uncertain objects also guide you on required speed limit as well as surrounding vehicle distancing moreover if some object struck in an instance quickly get alerted to emergency contacts through programmed application with details of live location and timings furthermore if emergency contacts people doesn't found situation normalized than within five minutes location will be forwarded to nearby medical emergency help so the every issue start getting cure till familiar or emergency selected person reach to the required location .it is particularly designed to notify safety in such a way where speed can be track and also navigate unknown roads as well as obstacles comes in between such as pits and other objects which become barrier in smooth safe drive.

Keywords:

AI safe drive alerting, ANSH, Analyzing route, AI Mapping, Live object detection.

Introduction:

Now a days we found many roadside issues sometimes due to over speed and driving in unconsciousness which becomes the issues for other vehicle pass through same road. On next phase we also see many pits, wet or soft landmass in addition to many uncertain objects which may leads to destruct smooth driving; hence ANSH is active AI which maintain alerts plus guidance about upcoming climatic change moreover all barriers condition to prevents accidents and maintain smooth drive. Not only this it will also track the required speed when other vehicle or objects in surround and starts alerting the driver at a same time will start stop indicators thus surrounded vehicle driver drives more precisely. ANSH acts as a virtual eye [1] which notify your surroundings while driving and serve you the best possibility when you are in trouble. it functionally designs in such a way that need not require WIFI or internet facilities in continuous as it collects auto recursive data set.

Here Section 2, describes about related work which were used before and supported as a refernces for this desired technical paper .In Section 3, there's a berief describe about ANSH. Section 4, express the difference between ANSH and traditional routing system as most often there is a confusion between routing systems.Section 5,represent a short brief of advantages of ANSH and the reason behind its use.Section 6,gives a description of application of ANSH i.e. where it can be used in our daily mapping drives. Section 7,states the details of future of ANSH and how it will be effective for the future in use. Section 8,reports the problem and its implementation using ANSH.Section 9 and Section 10 express about the key steps of

processing or the algorithm and results we get after the implementation of it respectively.Than finally there's conclusion in Section 11.

Related work:

Bradford W. Parkinson and Stephen T. Powers: in their research area "The Global Positioning System: Past, Present, and Future" they stated an overview of the Global Positioning System (GPS), its history, development, and its potential applications in navigation and positioning.

Alaa M. Alameldeen and Min-Te Sun: in their respective area "A Review of Localization Algorithms for Wireless Sensor Networks" they stated reviews on various localization algorithms used in wireless sensor networks, which are essential for location-based applications and navigation systems.

Angel A. Juan, et al.: in their respective area "A Review of Urban Traffic Management and Transport Systems" they stated reviews on various aspects of urban traffic management and transportation systems, including intelligent navigation and traffic control systems.

Kaiming He, et al.: in their research area "Deep Residual Learning for Image Recognition" they primarily focused on image classification, this paper introduces the concept of residual networks (ResNets), which have had a significant impact on object recognition and identification tasks.

AI powered Analyzing routes and Navigate Safe drive Helper:

Figure [1]

AI is used to define the prediction which is going to be found in near by zone or upcomming possiblity on the way with various alerts "there is croweded animals within 500m!", "drive slow there's rough streat within 700m!", "keep focus drive havey vehicle , approx distance 600m!", "be on left track ,there's a weavy vehicle coming from right at distance of 200m!", "drive in the speed of 60 !", "please note near 5km the climate is found little rainy!", "there is traffic hours in your desire location from 7pm to 8:30pm!", "going good , you can enjoy break time within 400m be on left if willing to break!" and many more where user targets the location . AI based Analyzer works as object identification moreover current movements alert such as climatic changes in the near by location, hilly and rocky areas quick falls ,land barrier and some wet or polly land as well as surroundance objects and notify if it becomes hurdles in smooth drive. Analyzer mainly focus on the detection of objects and prediction of uncertain situation in an surroundance.Navigator from the GPS receiver picks up signals from multiple GPS satellites which are overhead (usually at least four satellites). On next calculating the time, it takes for each signal to reach the receiver, the GPS device can determine the distance between itself and each of the satellites through which inspect the safety accordingly specify alert(*Kumar, S., DR. Sinhna, K. A., DR. Kumar, N.,2022*) moreover it also helps to finds the safe side to avoid accidents and such possibilities.on another phase it will also track the speed and that

will be alerted only to the selected contact futher more at the time of emergency it typically receives immediate attention from emergency dispatchers. Dispatchers will gather information about the situation and transfer the appropriate emergency services to the location i.e., nearby health care. More than that the help alert will direct forward the emergency location to the reference contact selected before or registered as emergency contact with the help of navigator data dispatcher (it is temp file data store and get auto expire when user reach to desire location safely or in another condition within 12 hours).This way ANSH compresses of analyzing, navigating and emergency helper through AI predictions ,detection and alerting object with auto recurring data set on routes planned for drive. ANSH uses segmented methodology of image processing, GPS, AI voice alert, weather forecast and networking protocol for emergency need transferring dispatcher organized data.

Procedural enhancing example of ANSH by applying random condition: user desired to reach at office place from home. We get the procedures done with the help ANSH [2] they are as follow:

Figure [2]

A. Enabling AI and combines the GPS track the sample targeted road design given by GPS. At the same time dispatcher will create a data set file.
B. When the user start driving VSS (vehicle speed sensor) will enable tracking speed and data set will be created in dispatcher [3]. Furthermore, navigator as well as analyzer enables through image processing object found will be alerted to user.
C. In this phase work of analyzer is to indicate the object identify by navigator is truly being barrier to user travelling if yes than set alert rest delete such data set from dispatcher (*Torralba, A., Fergus, R., Freeman, W.T., 2008*).
D. Finally, user reach to the desired location or if it's found to be in risk or emergency and need some hospitality by pressing the help button or in another condition AI safe helper unable when vehicle found to be crashed, or more pressurize in both the cases the immediate location with the help of TCP/IP protocol will be shared to predefined contact processing with dispatcher.

Difference between ANSH and Traditional Routing System:

Information spring: In traditinal routing system or in G-maps data primarily relies on a combination of data sources, including satellite imagery, street view images, user-generated data, and other traditional mapping resources. Where in ANSH AI can enhance mapping services by improving data processing capabilities. AI algorithms can analyze vast amounts of data, such as satellite images, to detect changes in landscapes, track road conditions, and update maps in near real-time.

Direction and navigating procedure: G-Maps provides turn-by-turn directions, real-time traffic updates, and various modes of transportation (e.g., driving, walking, public transit, cycling) to help users reach their destinations efficiently. Where in ANSH we get predictive information like AI can analyze historical traffic

patterns, weather conditions, and real-time data to predict optimal routes for navigation, considering factors like traffic congestion and accidents.

Explore and Suggestion: G-maps leverages search algorithms and user data to suggest places, businesses, and points of interest, making it easier for users to discover new locations moreover it offers Street View, which allows users to virtually explore streets and neighbourhoods, helping them get a visual sense of their destination. On another segment ANSH supports AI powered voice assistance for making navigation more convenient and hands-free as well as it tracks the speed and make you aware of better direction of drive further more it also provides alerting system in such a way that your pre define emergency contact gets the information and location track at time of your need.

Advantages of ANSH:

ANSH offers numerous advantages that improve safety, efficiency, and the overall experience of navigating both for individuals and organizations across various domains.

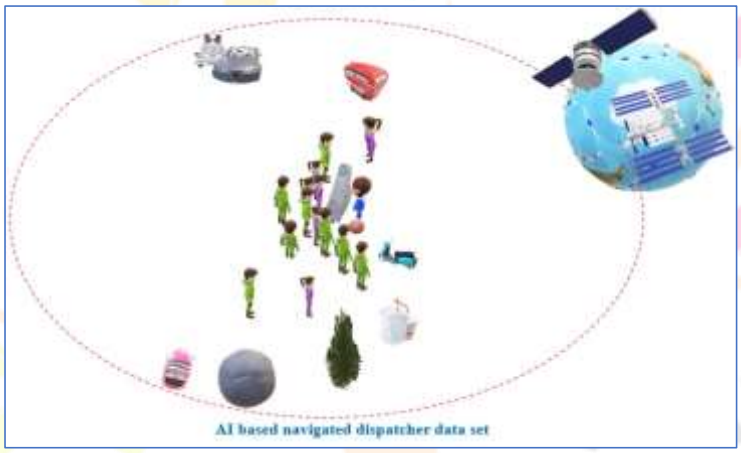

Figure [3]

Improved Accuracy: AI-powered navigation systems can provide highly accurate route planning and real-time updates. They use advanced algorithms to process data from various sources, such as GPS, sensors, and maps, to make precise decisions. AI-powered object identification algorithms can process and analyze images or video streams in real-time or near-real-time, enabling swift and automated responses to changing scenarios.

Real-time Traffic Updates: ANSH can analyze live traffic data from a variety of sources, including GPS devices and traffic cameras, to provide real-time traffic updates and suggest alternative routes to avoid congestion, accidents, or road closures.

Enhanced Safety: AI can contribute to safer navigation by providing collision avoidance systems and warning alerts. For example, in autonomous vehicles, AI can detect potential hazards and take corrective actions faster than a human driver. Moreover, it gives live alerted to pre define contacts as well as it supports safe night driving by identifying pit holes including wet or dry land mass.

Efficient Transportation: In public transportation systems, AI can optimize schedules and routes to minimize wait times and travel distances, improving the efficiency of the system and reducing operating costs.AI can tailor navigation recommendations to individual preferences. For example, it can consider a driver's preferred routes, speed limits, and even specific places of interest along the way.

Voice Assistants: AI-powered voice assistants like Siri, Google Assistant, and Alexa can provide hands-free navigation instructions, making it safer for drivers to get directions while on the road.

Autonomous Vehicles: AI is a core technology in autonomous vehicles. It enables these vehicles to perceive their surroundings, make decisions, and navigate without human intervention, potentially reducing accidents and improving overall traffic flow.

Geospatial Analysis: AI can analyze vast amounts of geospatial data to support urban planning and infrastructure development. This can lead to more efficient transportation networks and smart city initiatives. such navigation systems can assist individuals with disabilities by providing specialized routing and information, such as wheelchair-accessible routes or guidance for the visually impaired.

Predictive Maintenance: In the case of transportation fleets, AI can predict when vehicles or infrastructure require maintenance, reducing downtime and improving overall operational efficiency. AI can help organizations save money by optimizing transportation routes, reducing fuel consumption, and minimizing maintenance costs.

Continuous Improvement and Environmental Benefits: AI systems can learn and adapt over time, improving their performance with more data and experience. it can optimize routes and transportation systems to reduce emissions by minimizing idling time, optimizing fuel efficiency, and promoting the use of public transport

Obstacles identification: ANSH optimize better directly through image processing and provide alert at time before thus object or obstacles does not become barrier in safe drive.

Reduced Human Error: The risk of human error in object identification tasks is get minimize using AI, which is particularly crucial in applications where mistakes can have serious consequences, such as medical image analysis or autonomous driving.

Application of ANSH:

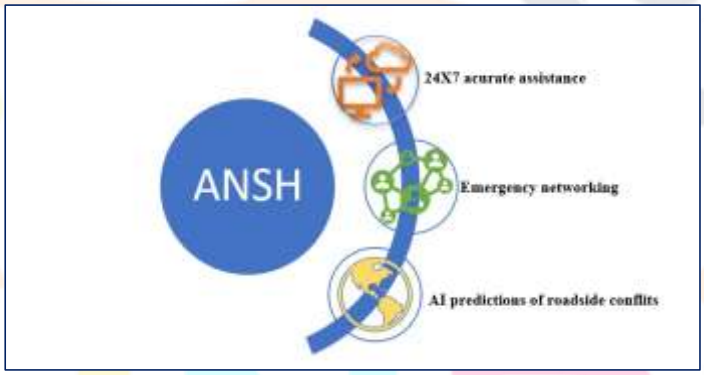

Figure 4

Secure Driving: ANSH has various AI smart sense which gives the reports about the security sensing in landmass, climatic updates as well as object barrier furthermore all detailing alert about surroundings fluctuating condition which becomes a reason for accidents.

Autonomous Vehicles: AI navigation is essential for self-driving cars and trucks (*Zohari, B. H. M. and Nazri, M. B. F. M., 2021*). AI algorithms process sensor data (e.g., LiDAR, radar, cameras) to make real-time decisions about vehicle speed, direction, and safety, enabling autonomous driving such way ANSH serves many functionalities for better decisions making [4].

Indoor Navigation: AI powered indoor navigation systems assist visitors in finding their way inside large buildings like airports, shopping malls, and museums. They often include interactive maps and directions on mobile devices.

Public Transportation: AI powered navigation systems can optimize public transportation routes, such as buses and trains, to improve efficiency, reduce congestion, and enhance passenger experiences.

Smart Cities: ANSH Navigation will be central to the development of smart cities. Integrated systems will optimize traffic flow, parking, public transportation, and emergency response, leading to reduced

congestion and improved urban living. Its initiatives by optimizing traffic flow, reducing energy consumption, and enhancing urban planning and management.

Privacy and Security: With the increasing use of ANSH user need not to worried in the difficult situation they have emergency help icon by single press it will alert their pre define contact and at the time of device break it will first transfer the desired location to their emergency contact and with in few minutes to nearby health care from incident place.

Future of ANSH:

The impact of ANSH will get spread within the organizations as it is really helping the organizations in many ways. In the coming years, the organizations will find more different ways to make use of ANSH and in different processes. There is a lot to do research in this area and hence organizations will surely take it to the next level. Organizations have found that using ANSH in functioning system will surely be not a good idea unless it is integrated with some other tool to make the best use of the software product.

Technical based:

Reduced Human Error: AI minimizes the risk of human error in object identification tasks, which is particularly crucial in applications where mistakes can have serious consequences, such as medical image analysis or autonomous driving.

Adaptive Routing: AI can adapt to changing road conditions and unexpected events. It can dynamically reroute vehicles to optimize travel time and fuel efficiency based on real-time data.

Multimodal Integration: AI can integrate data from multiple sources, including images, video, LiDAR, radar, and more, to enhance object identification accuracy and robustness.

Complex Pattern Recognition: ANSH can identify objects based on complex patterns, textures, and features of track or required route that may be challenging for humans to recognize consistently (*Bezak, P. ,2016*).

Improved Accessibility: AI object identification can assist individuals with visual impairments by providing real-time descriptions of objects in their environment. models can be customized to suit specific requirements and domains, allowing for tailored object identification solutions in various industries.

Accuracy and alerting: With the help of AI in recognizing models can be retrained or fine-tuned to adapt to new objects or changes in the environment, making them flexible and suitable for evolving applications.

Organizational based:

Advance delivering system: ANSH can be rapidly performing route organization by analysing historical data and customer behaviour, these systems can predict delivery demand, enabling proactive adjustments to delivery schedules and resources (*Abhilash and Asha, 2015*).

Integration with E-Commerce Platforms: Seamless integration of ANSH with online shopping platforms allows for a smooth shopping and delivery experience, including easy returns and exchanges.

Contactless Delivery: Especially relevant in the context of crucial situations like COVID-19 pandemic, advanced delivery systems prioritize contactless delivery options, allowing customers to receive packages without direct contact with delivery personnel by some advanced delivery systems incorporate autonomous vehicles, such as drones and self-driving cars, for faster and more efficient deliveries (*Ramkrishna, B., DR. Rajesh, R. S., Shaji, S. R., 2011*). These vehicles with ANSH can navigate traffic and obstacles autonomously.

Problem Statement and its Implementation:

Let us consider a situation from our everyday life. When a user needs to travel and route himself in emergency in unknown area or location in night time without knowing any place segment as it is not predicted by g-map as well as it is not identified area. To solve this problem, we use ANSH .it can predict the nearest register place and complete direction with AI navigation further more it will identify the object in navigated route and generate alert through dispatcher data set.

Algorithm:

1) Map Representation:
- Create a map representation of the environment, typically as a grid, graph, or continuous space with relevant features and obstacles marked.
- Generate or obtain a map of the environment in which the navigation will take place. This map can be a 2D or 3D representation of the area, including obstacles, landmarks, and relevant information.

2) Localization:
- Determine the current position of the vehicle or robot within the map. This can be done using sensors such as GPS, lidar, or cameras.
- Collect data from sensors such as LiDAR, cameras, GPS, IMUs (Inertial Measurement Units), and more to perceive the current state of the environment.
- Employ techniques like sensor fusion or particle filtering to improve localization accuracy.
- Determine the vehicle's or robot's current position (pose) within the map. This process often involves sensor fusion techniques to combine data from various sensors for accurate localization.

3) Path Planning:
- Determine a path from the current location to the destination while avoiding obstacles and adhering to constraints (e.g., speed limits).
- Common algorithms for path planning include:
  - *A (A Star) **: A heuristic-based search algorithm that efficiently finds the shortest path.
  - Dijkstra's Algorithm: Finds the shortest path in a weighted graph.
  - RRT (Rapidly-exploring Random Tree): Useful for exploration and obstacle avoidance.
  - Potential Fields: Attractive and repulsive forces guide the vehicle toward the goal while avoiding obstacles.

4) Trajectory Generation:
- Once a path is determined, generate a sequence of waypoints or a continuous trajectory that the vehicle or robot should follow.
- Consider factors like vehicle dynamics and control constraints in trajectory generation.

5) Control:
- Implement control algorithms to ensure the vehicle or robot follows the trajectory accurately.
- PID (Proportional-Integral-Derivative) controllers, model predictive control, or other control strategies are often used.

6) Sensing and Perception:
- Continuously sense the environment using sensors to detect and react to dynamic obstacles or changes in the environment.
- Perform object detection and tracking for real-time awareness of the surroundings.

7) Obstacle Avoidance:
- Implement algorithms to detect and avoid obstacles encountered along the path or trajectory.
- Methods like potential fields, occupancy grids, or reactive control can be used for obstacle avoidance.

8) Replanning:
- Periodically reevaluate the planned path and, if necessary, recalculate it to adapt to changing conditions or new obstacles.
- Continuously loop through the above steps to ensure the navigation system adapts to changing conditions and keeps the vehicle or robot on the correct path.

9) Feedback and Adaptation:
- Continuously monitor the vehicle's progress and sensor data.

- Use feedback control loops to adapt to deviations from the planned path or unexpected events.

10) Safety Measures:

- Implement monitoring and diagnostic tools to detect and respond to system failures or anomalies, ensuring the system remains safe and functional.
- Implement safety mechanisms, emergency braking, or other fail-safe strategies to prevent accidents in case of system failures or extreme situations will implement emergency calling and location sharing algorithm.

algorithm for direct calling and location sharing (if applicable):

i. User Authentication:
   - Users must create accounts or log in to the application using their credentials (e.g., email or phone number).
   - Implement security measures to protect the location data during transmission and storage.

ii. Contact List Management:
   - Users can add contacts to their contact list. These contacts could be friends, family members, or other users of the application.

iii. Initiating a Call:
   - To initiate a direct call to a contact, the user selects the contact from their list.
   - The application establishes a real-time communication channel, which could be based on VoIP (Voice over Internet Protocol) technology.
   - The call request is sent to the selected contact.

iv. Call Acceptance:
   - The contacted user receives a call notification.
   - They can choose to accept or reject the call.
   - If accepted, the communication channel is established between the two users, allowing them to have a direct conversation.

v. Call Features:
   - Implement features like mute, speakerphone, and end call options during the call or voice alerted message when call is received by user it is auto rejected call.

vi. Call History:
   - Maintain a call history that records details of past calls, including date, time, and duration.

Location Sharing Algorithm (if applicable):

vii. User Permissions:
   - Obtain user consent to access their device's location information.

viii. Location Retrieval:
   - Retrieve the user's current location using the device's GPS or location services.

ix. Sharing Location:
   - Users can choose to share their location with selected contacts.

x. Location Update Interval:
   - Define how frequently the user's location should be updated and shared. Common intervals include real-time updates, every few minutes, or user-defined intervals.

xi. Location Privacy:
   - Users should have the option to stop sharing their location at any time.
   - Implement privacy settings to control who can see their location (e.g., specific contacts, everyone, or no one).

xii. Location Display:
   - On the recipient's end, display the shared location on a map, along with relevant details like the user's name, timestamp, and accuracy radius.

xiii. Continuous Updates:
   - Continuously update the recipient's map with the user's location as per the defined interval.

xiv. Location Revocation:

- Users should have the ability to stop sharing their location with specific contacts or for a specific session.

11) Testing and Validation:

- Thoroughly test and validate the navigation algorithm in simulation and real-world scenarios to ensure it meets safety and performance requirements.

12) Continuous Improvement:

- Collect data from real-world deployments to improve the algorithm's performance and adapt to diverse environments.

Result:

We get the required data set and the object identification alert when the object becomes barrier in the routes on the next phase it also defines weather conditions and various landscape designing issue which is not predicted by human and current routing system easily and so fast as ANSH can predict as well as navigate recognize alerts.

Table 1 – ANSH Dispatcher data set for navigating alerts

Predicted objects	Notable true/false	Alert to be descripted by AI voice
Trees in 500m left-facing road	False	
Car like object speed of 60 100m away right facing road	True	Please, drive in the speed of 50 and be on the same track! There a wave driving object from right side above, don't leave track! Drive freely, till 5km no recent barrier in your way!
Rain in next city	True	There is rainy atmosphere with in 5 km! Please drive in speed of 40 as the landscape is not clear! Pit holes in near 100km try to be on the left-facing of road! Good drive you are out of road disturbance!
Railway track	True	There will be closing track within 20 minutes with in 6km! Going good maintain the track and speed! Have a much break, in near tea stole in your left 500m to avoid track traffic!
Landscape with tress and plant	False	
Animal crowd	True	Maintain the speed of 20 to 30 till 600m due to coming crowd! Try to be on the right-facing on road to come out of your jam soon! Great drive safely with ANSH till your desire location!

Conclusion:

ANSH is the best way to find your safe way or routing with live and updated alert. It also react as your safe drive assistance moreover it will also emergency supporter by passing the required details to your predefined contact . Hence no need to worry by human decision for the complicated route and night driving. Humans can make mistakes, but ANSH can't, which automatically increases the efficiency of any task. It just follows the instructions given to it. The organizations or users are making most use of the ANSH and it has been proved beneficial for them in every aspect. It will definitely grow in future and will combine with other technologies to make the most use of itself. This paper, just state a small example of how to use ANSH in our everyday lives. On the larger scale, we can use it for other big purposes so to enjoy safe and secure drive and accurate error free repetitive tasks.

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