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A Novel Realistic Future Flying Car using machine learning

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ABSTRACT: As the number of vehicles is increasing at a very high rate on the roads and it is almost becoming impossible to travel, there needs to have a solution for the traffic congestion. Many methods were tried and almost every method has some or other drawback[7]. The only solution for reducing traffic congestion is to have a triple mode car, which should run on road, water and should fly in the sky[3]. This will definitely reduce the traffic congestion and will also provide or perhaps helps to start a thought process in designing the same concept car. These cars will be useful for a different section of people in terms of commercial and personnel use. People can travel on their own or can use the same for delivery of goods from one place to another and even for lifting patients from a place to a nearby hospital. This means this car can be a lifesaver vehicle. Many issues need to be addressed to make it a safe triple mode car. Here we have to design a car with road safety measures, safety measures necessary to fly and also we need to take care of safety measures to run on the water It has become inexcusably obvious that our technology has exceeded our humanity[8].---

Keywords: Traffic congestion, Design car, Safety measures, Radar, Flying, Futuristic.
ALBE RT EINSTEIN.

INTRODUCTION: 'Flying car', 'Street car', 'swimming car' a triple mode car will help to fulfill the long pending dreams of aviation, automobile, and navy enthusiasts[6]. As this car will bring the best in 3 worlds. The basic purpose of this car is to solve the problems about traffic congestion on roads, where we find many people getting struck every day in this traffic which not only damages their health and also wastes a lot of time traveling. The concept here is to see that this car not only allows people to travel on road but also to fly in the sky depending on the requirement and distance to travel, apart from swimming in the water[2]. The car will have to cater to different needs of the people and will help the future generation to travel in the manner they prefer. The design of this car will have multiple obstacles as it has to satisfy the regulation of the 3 different worlds. Tech titans like Uber, Amazon, and Google have all laid out ambitious plans for filling the skies with autonomous aircraft[4]. Uber wants to move people

around with flying taxis, and Airbus is committed to producing this kind of vehicle.

Meanwhile, Google and Amazon are hoping to deliver packages with much smaller drones. All see the potential for fleets of unmanned aerial vehicles that can pilot themselves[5]. But to make that vision a reality, we're going to need a new breed of sense and avoid technology. Echo dyne, a Bellevue, Washington-based startup, believes it has the answer. The company announced preliminary test results from field trials of its MESA-DAA radar system today[2]. It says the device, which is barely larger than a Smartphone, is capable of detecting even small aircraft at a distance of 1.8 miles in varying weather conditions. The company says this breakthrough is driven by the use of met materials, which allow the radar to eliminate moving parts, making the hardware smaller and more battery efficient without sacrificing range[1].A lot of modern

automobiles are now equipped with radar systems, in fact, Tesla recently announced that it would be focusing on the radar as the core technology in its autonomous driving system[1]. But even long-range automotive radar from the likes of Bosch and Delphi only claim a range of a few hundred meters. They also don't typically have a very wide field of view. Echo dyne's technology claims to be able to have a

120-degree field of view in azimuth (horizontal) and 80 degrees in elevation (vertical). Founder and CEO Been Frankenberg also says his tech was designed to track a Cessna-sized object, which is much smaller than a car in radar cross section[5].

DESIGN CONSIDERATION:

Some of the specifications to be determined by the design approach are:

- Range of run
- Endurance
- Rate of climb
- Cruise speed in air
- Cruise speed inland
- Cruise speed in Water
- Airworthiness standards
- Automobile safety and emissions.

Challenge:

A practical flying car should be capable of safely taking off, flying, and landing throughout heavily populated urban environments. However, to date, no vertical takeoff and landing (VTOL) vehicle has ever demonstrated such capabilities [3].

Driving a flying car would require a pilot's certificate and also an initial training of 18- 40 hours and foremost, along with a driver's license for a flying car. The flying car would require intensive maintenance for keeping it in perfectly workable condition matching initial technical standards and rules for government regulatory requirements. Some of the major challenges in flying car technology are the VTOL capability, the powering system for the vehicle, and also many safety issues. It seems the technologists have been able to find viable solutions to these problems and the name 'flying cars' would be replaced by something more technical. And very soon the flying cars will be taking to the skies[1].

Safety:

Although statistically, commercial flying is much safer than driving, unlike commercial planes, personal flying cars might not have as many safety checks and their pilots would not be as well trained[2]. Humans already have problems with the aspect of driving in two dimensions (forward and backward, side to side), adding in the up and down aspect would make "driving" or flying as it would be, much more difficult; however, this problem might be solved via the sole use of self-flying and self-driving cars.

Economies:

In addition, the flying car's energy efficiency would be much lower compared to conventional cars and other aircraft; optimal fuel efficiency for airplanes is at high speeds and high altitudes while flying cars would be used for shorter distances, at a higher frequency, lower speeds, and lower altitude. For both environmental and economic reasons, flying cars would be a tremendous waste of resources [4].

Existing System: In the existing aviation industry, much of the mechanics of flying are automated [1]. Given the challenges of a person flying compared to driving a car, and the efforts to reduce human error in aviation, there is even more likelihood of flying cars becoming automated so that no human pilot is needed. But there will be differences between existing aviation practices and flying cars. Passenger jet air travel owes much of its impressive safety record to improvements in aircraft maintenance procedures and our understanding of failures.

It is unlikely that the business case for small flying cars will allow for such rigorous practices. Instead, flying cars will be less complex than modern jets, and the latest demonstrators show exactly that. The use of large numbers of small electric motors, such as in the Lilium all-electric aircraft, reduces the maintenance complexity drastically. It also provides an inbuilt measure of redundancy in case one motor fails [4].

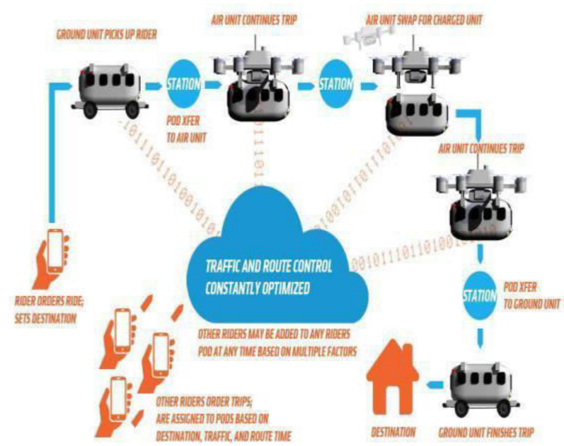
How flying car works: we’re currently in the midst of a new round of flying-car hype. Uber is even having some big flying car events in Texas this week. Historically, every bit of flying-car hype proves to be bullshit. But it may not have to be; I think I have an idea about how flying cars could make sense, even it's not exactly how Uber is imagining it.

Uber's plan, as it seems to stand now, relies on the use of small, vertical-takeoff-and-land (VTOL) aircraft. Just using tiny planes inside a city.
I think this approach is too simplistic, and won't be able to scale in any way that makes sense. I think I have a better idea.

Now, your gut reaction may be to not like it because the fundamental, romantic appeal of flying cars has always been the incredible independence and freedom them. Flying cars, going back to the first experiments in the late '20s and through the era of flying Pintos and into today, have always conjured up images of living on inaccessible islands and flying into work every day, and jaunting off to wherever you'd like, looking contemptuously at the ground and those miserable bastards stuck in traffic[2].

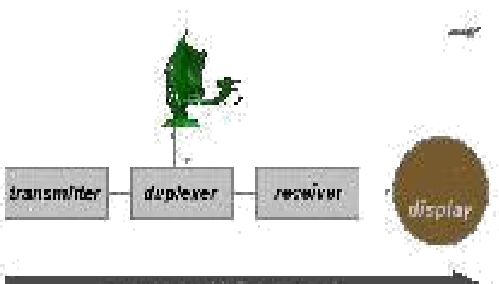
The truth is, though, that's just not going to work. If we want flying cars to happen, we have to get rid of the concept of just translating personal, private cars into the air. The logistics and traffic management of large numbers of independent flying cars is just too inefficient and difficult to manage, and the issues arising from mechanical failure or driver/pilot error are too unforgiving. We need a new way to conceptualize the whole idea, and the way that works isn't exactly sexy: flying (and driving) buses. Buses, like most public transportation, aren't nearly as exciting as your private car, but it makes more sense in this context. Plus flying has a huge advantage over every other public transportation network out there, and that advantage is the key to why flying buses make sense: the routes can be dynamic, optimized, and changeable on demand. There's no massive, city-wide infrastructure cost for flying vehicles. There are no roads to build, no tracks to lay, no tunnels to dig. I'm imagining a system of

flying/driving vehicles that use a resource we have plenty of computing power to constantly adapt and change to meet demand and traffic. First, we have the basic vehicles, which consist of three main components: a passenger pod, a VTOL air unit, and a street-going wheeled ground unit. The passenger pod can dock with either the air unit or the ground unit as needed.



The air unit and ground unit are autonomously controlled, in constant communication with central traffic controlling and route managing system. A human pilot/driver can be on board to act as an emergency safety backup, but would not be able to fly the vehicle in normal operation[1].

Oh, and the airspace for the flying would be in a zone just above skyscraper-level in a given city, well below the altitude of commercial (and private) aircraft. The FAA can figure out the parameters of that. These vehicles can be powered by combustion motors or can be electric; since there seems to be a desire for systems like these to be electric (reduced pollution, noise, efficiency advantages) let's consider them to be electric for now. Both vehicles can drive or fly with or without the passenger pod. Moving without the passenger pod will only need to happen for purposes of moving resources/vehicles from station to station or for recharging. There are two basic types of stations in this transportation system, rooftop and ground-level. Rooftop stations will be more common in large, dense cities, and will only have air units available. The distance between stations and the number of stations will be dependent on the range of the air units[2].



All targets produce a diffuse reflection i.e. it is reflected in a wide number of directions. The reflected signal is also called scattering. Backscatter is the term given to reflections in the opposite direction to the incident rays[4].

Radar signals can be displayed on the traditional plan position indicator (PPI) or other more advanced radar display systems. A PPI has a rotating vector with the radar at the origin, which indicates the pointing direction of the antenna and hence the bearing of targets[2].

Transmitter

The radar transmitter produces the short-duration high-power rf pulses of energy that are into space by the antenna[3].

Duplexer

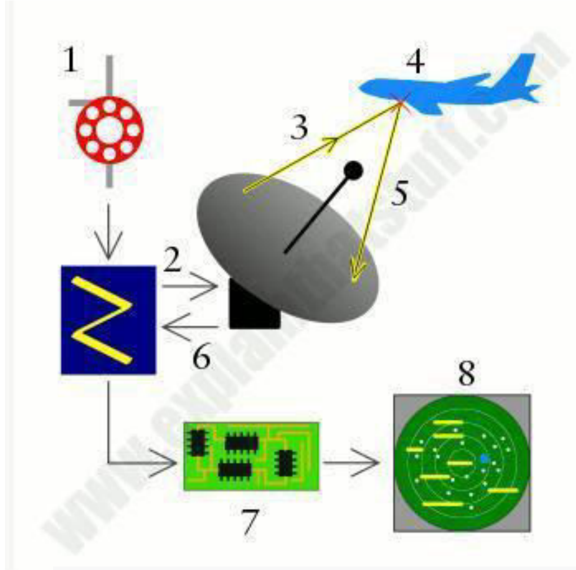
The duplexer alternately switches the antenna between the transmitter and receiver so that only one antenna needs to be used. This switching is necessary because the high-power pulses of the transmitter would destroy the receiver if energy were allowed to enter the receiver. Receiver

The receivers amplify and demodulate the received RF signals. The receiver provides video signals on the output. Radar Antenna The Antenna transfers the transmitter energy to signals in space with the required distribution and efficiency. This process is applied identically to reception.

Indicator

The indicator should present to the observer a continuous, easily understandable, graphic picture of the relative position of radar targets.

The radar screen (in this case a PPI-scope) displays the produced from the echo signals bright blips. The longer the pulses were delayed by the runtime, the further away from the center of this radar scope they are displayed. The direction of the deflection on this screen is that in which the antenna is currently pointing.



Here's a summary of how radar works:

1. A magnetron generates high-frequency radio waves.
2. Duplexer switches magnetron through to antenna.
3. The antenna acts as a transmitter, sending a narrow beam of radio waves through the air.
4. Radio waves hit the enemy airplane and reflect.
5. The antenna picks up reflected waves during a break between transmissions. Note that the same antenna acts as both transmitter and receiver, alternately sending out radio waves and receiving them.
6. Duplexer switches antenna through to receiver unit.
7. Computer in receiver unit processes reflected waves and draws them on a TV screen.
8. The enemy plane shows up on TV radar display with any other nearby targets.

Conclusion: As flying car companies innovate their business models, an array of new business services are expected, such as aerial sightseeing, air surveillance-as-a-service, aerial critical aid delivery, air taxi pay-per-ride, and flying car corporate lease. Various flying car market participants have adopted different strategies for growth and expansion: Ehang is developing a flying drone with VTOL and autonomous flying capabilities · Toyota has acquired a patent for Aero car, a shape-shifting flying car and also invested in Cartivator, a Japanese flying car start-up· Airbus, Car plane, and Lillium are expected to release flying cars in the next five years[2]. Pre-selling of PAL-V's Liberty Pioneer flying car has begun, with delivery expected by 2018. Airbus self-flying aircraft Havana is scheduled for production by2021.· Kitty Hawk is developing a flying car with investment from Google· Flying car prototypes are being developed by Aero Mobil and Terrafugia Airbus, in collaboration with Italdesign, is developing autonomous systems for its Pop. Up flying car.VTOL capabilities, autonomous flying technologies, and the development of fail-safe features, will be imperative to inspire confidence in potential customers and overall acceptance of flying cars as vehicles for urban mobility," noted the analyst. "Makers of flying cars must work with regulators to ensure that clearly defined and industry-friendly rules for flying car operations are passed."

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