Project ideas

As of today, where advanced technologies ranging from AI driven bots to big data analytics system emerge in great numbers and dominate a significant part of our daily lives, our society can be accurately defined as an intricate and complex environment filled with unprecedented inventions and breakthroughs in all possible sectors. Among these groundbreaking innovations, a notable one to mention is the AI-driven self-driving technology. This technology, which is mainly derived from the combination of intelligent AI systems and an enormous number of sensors including but not limited to radar, lidar, sonar, GPS, odometry, and inertial measurement units, has been widely applied and used in ample fields and settings. Its existence has enabled many intelligent and smart systems to be established which were then utilized by consumers of all backgrounds to meet their varied needs ranging from transportation needs, commute needs, auto-detection of objects needs, and more. With this context set in place, the ideas for our project are to build a smart self-driving software based on AI algorithms which will then be installed on matching hardware’s, hopefully most of vehicles from notable brands on the market, to enable these equipment’s or vehicles to fully drive on their own without human intervention. To be exact, we would like to develop a software which utilizes advanced AI algorithms to help host vehicles automatically detect objects within its surrounding environment in order to enable it to not only drive on its own with safety in mind, but also to avoid incoming obstacles at all times and constantly gather external data which will later be used in the self-learning process so the software itself becomes more intelligent over time on a gradual basis. Ultimately, our end product will be a software that helps consumers to drive safety in their vehicles without need to intervene and at the same time becomes smarter through learning more about the complex environment it is within so it can continuously deliver better services for the clients.

As indicated, our product will be an AI-driven software that works on most brands of vehicles. To reach this goal, the following implementation process is necessary. First, we will establish an exclusive development team of our own six members where each member is hopefully an expert in one of the many areas that are associated with self-driving

development. For instance, we would have an expert in back end development to handle API requests, servers, and database related issues, an expert in front end development who's responsible for the UI and GUI of the software, an UI specialist to handle the product aesthetics and exterior design process, an AI expert who is proficient in self driving algorithms so he can resolve issues of this space, and a math-oriented expert who can manage problems related to sensors calculations, data processing, and other mathematical issues. We need to closely examine each candidate’s individual competencies such as how well they can perform their tasks in the respective fields without obstacles and their technical expertise. If a candidate cannot deliver the technical requirements quickly and therefore produce quality-assured results, then the overall development results may be delayed or decreased in quality. On the other hand, we also need to perform a personality test on each potential candidate to determine if he can work well as part of the team. If the team members are unable to collaborate with one another in a unifying manner, it would become overly difficult for the team to work mutually toward the same goal, especially when this specific project requires constant and frequent collaborations among the team members since ample changes are required to be made as experiments of the product are conducted. Our members will work together in cooperation and aim to roll out a prototype product within a predetermined time, hopefully in two to three months. The key here is to initially hold group meetings to come up with a rough product design that absorbs many of the well-done features from existing products on the market so team members can then mutually work toward building the product that aligns with this first product design. During the process, on site and live experiments will take place so the product will be constantly tested and improved while it is being developed. It will go through an intense stage of trial and error as newer features are developed while poor features are either removed or enhanced. Two to three months later, hopefully the first version of the product will be entirely built out. At this point, it will be thrown into the market on a small to medium scale to determine how well it is able to adapt the real market and meet consumers critical and complex needs. After two to three weeks of in market testing, feedbacks will be collected, analyzed, and evaluated and the team will then hold another round of meetings to determine the next major steps to take. Whether to improve the product, add new features, remove certain product functionalities, adapt product to needs or demands, and more will all be determined at this stage. If there is no major setback against the product, the above process will be repeated every three to four months until the product reaches a stage of maturity where it is widely accepted and recognized by consumers and is able to yield considerable revenue for the company. Thus, the development stage of the product concludes. Apart from the setup of the team, the design and development stages, there is also the stage of testing which shall be closely defined here. The testing stage primarily consists of the steps needed to frequently test the product in real, not simulated, settings on a frequent basis in order to ensure that it not only functions correctly but also satisfy the complex needs of the consumers. The product should be sent out as testing samples to randomly selected users of different modern vehicles and then our company would ask these users to participate in our experiments. We will ask these participants to drive at specific intervals during times of their choosing while our software is being installed within their vehicles’ hardware’s. During these predetermined time intervals, we will ask our users to make notes of the driving experiences they are experiencing so they can later use these data to fill out questionaries that we have prepared for them well in advance. They should consider issues such as whether the driving experience was smooth and unobtrusive, how well the software is able to direct the vehicle so all incoming obstacles are avoided on time to prevent accidents, how sufficient is the software in terms of its capability to learn from past data so it can perform better in future drives, how well the software is in terms of its competency to detect all kinds of foreign objects in the constantly changing external environment such as roadblocks, humans walking by, moving vehicles or objects, and the like, and more factors related to software’s overall performance, responsiveness, efficiency, and smartness. As users finish their given drives, they will then fill out surveys mentioned before which is comprised of thirty to fourth simple questions that asks them to rate the different components of the software, or its level of performance, efficiency, capacity, and other performing factors. We will collect all data and analyze results from these results to finally produce a comprehensive report that indicate areas of improvement required for the software to perform better in future testing cases. To sum up, selection of team members, design stage, development stage, and testing stage are the four major procedures that need to be undertaken for our project ideas to be effectively and efficiently realized.

As highlighted, smart self-driving technology is one of the frontier innovations that enables consumers to drive without the need to intervene or manually control their vehicles. It is made possible through development of a piece of software based on AI algorithms and other sensory components and in our case, this would require the formulation of a small yet specialized.

Team where each member will be responsible for a key piece of the product's entirety. The team will aim to make this product by going through the design, development, and testing stages. As for the actual implementation process, it will consists of the following procedures. First, we will select few of the highest ranked and regarded object-detecting algorithms from GitHub’s most starred repositories so at least we are using algorithms that are already approved by the coding and engineering communities. Then, we will hold inner technical meetings to discuss which algorithm is more suitable for our use case, or common driving needs in our case. A intense meeting will be held between our engineers and mathematicians to examine this issue as technically as possible to ensure we are using the most effective and supportive algorithm possible. Then, we will have our software engineers design the actual product’s back end system and front end interfaces so they are developed on top of the selected algorithm. The back end system needs to handle requests from ample users at the same time and the front end interface needs to be beautifully crafted to ensure top notch user experience and aesthetics. Then, we will integrate the back end, front end, and algorithms altogether as in any normal software development process so it not only works but also is also capable of handling many concurrent user requests at the same time. As for the programming languages, we are likely to use C++ or Java to develop back end system as they are capable of handling high user demands with high responsiveness and low latency. This way it will be assured that our product will respond quickly and efficiently to constant demands from users who are driving and demanding use of our software’s services. Meanwhile, embedded front end frameworks will be compared and contrasted and the most visually appealing one will be chosen to be used for our project. Once the initial prototype is designed and developed, we will run this app or software within simulated environments first to test for possible bugs and malfunctions. Once this rough version has been tested enough times so that is is capable of handling actual user demands in real driving situations, we will conduct in market testing where the app will be selectively distributed to participants’ vehicles and have them experience and rate the product. If all goes well, we will end up accomplishing a product that lets users to drive most market vehicles effortlessly while ensuring that their safeties are always in check and protected within an acceptable time frame. It is expected that a mature, self-driving software will be widely distributed and used in the market quickly should all above steps transition well enough from one to the next without major setbacks. Moreover, we envision our product to be able to support consumers of modern vehicles to drive safely, quickly, and efficiently.