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Invention Disclosure form - Confidential

The video below would help you with understanding " the exact information needed to file a patent application that is creating invention disclosure for your invention." video link:
https://youtu.be/2ft_oQ0uR8I

Information needed to file a patent application : creating invention disclosure - Prasad Karhad

1. What is the title of the invention? (10-15 words)

   Edge based Artificial Intelligence for Traffic enforcement solution.

2. What is the abstract of the invention? (150-200 words)

   With rapid urbanisation, increase in the vehicle population (two-wheeler and four-wheeler) and better road infrastructure it is becoming very difficult for law enforcement agency to enforce traffic regulation. Our innovation addresses this problem, our solution is combination of hardware and software. Our product is edge based AI solution, that means all traffic visible violations like riding without helmet, triple riding, use of mobile phone while riding, over speeding detection etc are detected using AI and DL challan is generated on the fly, here law enforcement agency can enforce on the spot or through electronic challan. At present law enforcement agency use edge based CCTV or CCTV with server based analytics in both cases CCTV is common and is mounted on the pole or tripod with raw power supply and/or with UPS battery. Whereas our solution is android phone based or single board PC radar connected to it as optional. It can be hand carried and/or can be mounted on tripod, our solution is very cost effective solution.

3. What are some keywords that describe the invention?

   AI-DL based traffic enforcement, compact speed enforcement, Andorid / Linux traffic AI , phone based AI solution , android AI based e challan system

4. What are the existing technologies in the field of your invention and their limitations?

   a. Edge based CCTV
   b. CCTV with server based AI

in solutions CCTV is mandatory CCTV requires infrastructure that is it needed to be mounted on pole , requires power supply that is raw power of UPS battery not all cameras supports radar connection

for the speed detection, over solution is complex , costly and bits and pieces so there is no seamless integration.

limitations – complex solution requires skilled person to implement , requires complex infrastructure , many component involved not seamless integrated solution , not scalable , very expensive

5. What problems does our invention solve and how does it overcome the limitations of existing solutions or technologies?

At present law enforcement agency does not have integrated solution. That is for speed enforcement they use speed laser gun or speed radar this does job of over speed capturing, its bulky solution needs to be mounted in the vehicle (four wheeler) requires power external power source no other traffic violation can be detected. For other different visible analytics at present CCTV camera is being used , these need to mounted on pole get power supply for electricity department or from local body lots of civil work like digging roads etc lots of civil infrastructure needed to be built. Connecting these cameras to centralized command center mostly through optical fiber or wireless when it is small scale, at the command center video feed is processed and with help of AI-DL technology traffic violation is detected as this solution involves lots of dependencies it is not very efficient solution and also very expensive solution

Our solution over comes all these solution as our solution is compact hand-held device

Advantages of our solution

a. compact handheld device use of android phone or single board PC
b. comes with speed radar sensor
c. all visible offence like without, helmet triple ride, use mobile phone while driving etc AI analytics carried out in the phone/ single board PC
d. no need of any civil infrastructure
e. no need of fiber connectivity
f. can be enforced any location based on demand as it is not fixed based.
g. scalable and upgradable

6. Can you provide a detailed explanation of the invention with working examples?

Traffic enforcement is done majorly in the two ways
1. Spot Fine 2. E challan
Spot fine is done using PDA with built in printer or mobile phone with Bluetooth printer is used. This type of traffic enforcement officer does the enforcement on the spot for visible offence this is majorly non-evidence-based enforcement. The e challan system uses CCTV camera its mainly evidence-based enforcement.

Our solution is handheld device, that is a compact radar mounted on the tripod or selfie stick to which android/single board computer is connected power to the radar is drawn from the android phone (OTG) / single board computer. Radar sends speed of the vehicle to the application running in the android/single board application then process the data sent by the radar and present in readable format. Our AI based software application running in android/single board computer will process other visible offence like without helmet , triple

riding use of mobile phone etc and captures the number plate number will be extracted and shall fetch vehicle owner address through VAHAN API and challan will be generated. To print cash receipt we shall provide Bluetooth printer.

We shall have option to configure the user and spot fine or e challan this configuration will be done by the administrator based on the configuration office can do spot enforcement or captured data sent to server to process e challan, once e challan is generated printout of the challan is taken then sent to violator by post.

Web based application for the various admin configurations , station level users for generating various reports both statistical and graphical reports.

7. Please attach any relevant diagrams, drawings, reports, papers, charts, Block diagrams or flow charts, or any other relevant diagrams to explain the invention.



8. What aspects of your disclosure do you want to claim or monopolize? Proposed claims?

Hand held Android phone/single board computer-based AI application with/without speed enforcement

9. Have you conducted a novelty search / Patentability search? If yes, which databases/references did you use and what were the search results?

No

10. Would a person of average skill in your technology area have developed your invention using existing knowledge in the public domain? If not, what could be the reasons?

Yes.

11. Please provide broad workable ranges for parameters involved in your invention, if applicable. for example, temperature range (100 degrees to 120 degrees), etc. or any relevant range if applicable to your invention (leave it blank if it is not applicable to your invention)

12. References (if any).

13. Inventors' details (full name, nationality, and address).

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14. Applicant's details (full name, nationality, and address).

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15. Any other relevant information.

Radar used - OPS243-A Doppler Radar Sensor

Android Phone – phone with min 8 gb ram , 50mp camera and GPU

Single board PC – Jetson Nano / Raspberry PI -4 / Banana PI

Camera for Single Board PC – wave share camera / Arducam