Task description

Open Task, Automotive category

Title: **Use DL & AI to make driving and transportation easier, safer, smarter.**

[Nauto's](#) mission is to make driving safer and fleets smarter. Come up with a project that makes driving and transportation easier, safer, smarter. Write an app for your smartphone or tablet, possibly using voice AI, vision AI, maps API, collect, process and analyze camera and sensor data, to help solve topics such as

- Driver attention monitoring
- Driving behavior understanding
- Road condition understanding
- Creative ways of interacting with drivers
- Anything related to improving driving safety and economy

Whether you analyze the data directly on the phone or in the cloud, big or smart data does not play a role. There are no explicit restrictions on which technologies, frameworks, programming languages, cloud APIs, public datasets, and hardware to use. We hope to see teams coming up with creative ways to help drivers to stay safe and relaxed and to make transportation more efficient and economic.

FAQ

- Do we need to code a fully functional app with backend systems ?
    - If you want, you can do that. But we are more interested in innovative ideas, new concepts, out-of-the-box thinking. So it is fine to code an app with full or limited functionality, or a demo, presentation or create just some fancy UI mocks. However, if it is just a mock, please make sure that you keep technological feasibility in mind so that you can outline how the technology should be implemented.
- How will the presented solution be judged ?
    - The jury consisting of several Luxoft and Nauto experts will judge the presented solutions by these four aspects:
        - Creativity and innovativeness (0.4)
        - Reach. How many users would benefit from the solution ? (0.3)
        - Estimated impact on the overall safety and efficiency of transportation. (0.2)
        - Technological feasibility and (remaining) implementation effort. (0.1)

- ○ Each member of the jury grades each project in all aspects mentioned above using an integer scale 0, 1, …, 5, higher is better. Votes within each aspect are averaged for a given project. Final score is derived by computing the weighted sum of aspect scores. Weights are given next to the aspects above. Projects are ranked according to final score.
- Is there any input data to get started ?
  - ○ In order to give contestants some input data to work on, we uploaded various dashcam videos to Google Drive (link here). Each video records 60 seconds of real driving in Poland. Most videos present a view of the street through the windscreen. A few videos show the inside of the car during driving. Some videos display slightly dangerous situations. Some of the videos have a subtitle file that shows GPS coordinates and other info. **All videos made available are solely intended to be used by contestants for solving the tasks presented by Luxoft and Nauto during the Hackyeah Hackathon 2017. All other uses of the presented data, especially further publishing of the material beyond the scope of this Hackathon, is prohibited.**
- Do I **have to** use the video data provided ?
  - ○ No, the data is provided to help you getting started with the projects. You could come up with a project that relies solely on Maps and Voice cloud APIs. Or a new way of alerting the driver without distracting his/her focus from the traffic situation in front of the vehicle. Or a smart way of sharing car rides. Unleash your creativity to come up with innovative ideas :)
  - ○ Here a code snippet to load the .3gp format:

```
import numpy as np
import cv2
import time
import matplotlib.pyplot as plt
%matplotlib inline
cap = cv2.VideoCapture('/Users/cmerk/Desktop/2017_10_22_20_05_41.3gp')
counter = 0
while(cap.isOpened() and counter < 10):
        ret, frame = cap.read()

        gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)

        plt.imshow(np.flipud(gray),cmap='gray')
        plt.show()
        counter += 1

cap.release()
cv2.destroyAllWindows()
```

- Can I use external DL services, Cloud APIs etc. ?
  - ○ Definitely yes. Use Google Cloud, AWS, Azure, Maps API, Voice API, whatever you can legally access. Virtual machines, docker images, Kubernetes, all is fine.
  - ○ You can also use external website offering CV related analytics and processing, e.g. Segnet (see examples results below)

Sky | Building | Pole | Road Marking | Road | Pavement | Tree | Sign Symbol | Fence | Vehicle | Pedestrian | Bike

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