SmarterRoads Hackathon Submissions to Date

Updated September 29, 2018

Title: Talk DOT First Place winner

Designers: Ranjani Chandran and Santhosh Kumar

Description: Hands free Alexia application that can talk to you about road conditions.

Link: https://devpost.com/software/talk-dot

Title: LiveDrv Second Place and People's Choice winner

Designers: James Johnson, Austin Galyon, Tonia Seenauth, Chazona Baum, and Christian Kagel Description: LiveDrv is an application that will use state provided data on historic traffic crash locations, active construction zones, and current driving behavior, such as speed, to reward users with points. Users are incentivized to leave their phones alone while driving, and will receive audio warnings of upcoming road conditions or situations to be aware of.

With the partnership of state and local entities, as well as commercial businesses, the application could become an official way to recognize good drivers, and reward them with tangible goods such as: free parking, positive driving record points, or even free coffee. The goal for the application, is to use as much official data and driving behavior as possible, to reward good driving habits, provide drivers with hands-free information, and prevent distracted driving on Virginia roadways.

Gamification works for modifying behavior. By rewarding points and badges to the users, the app encourages less distracted driving, while simultaneously providing warnings and road condition information to drivers. Warnings could include state and local police officers making stops, or responding to vehicle accidents, VDOT road workers, and other official workers on or near roadways.

By partnering with state and local government, and even commercial businesses, rewards could be offered to drivers to continue to reinforce good driving habits.

Link: https://devpost.com/software/livedrv

Title: Headsup - Smarter Roads Traffic Light Mobile Dashboard Safety Winner

Designers: Jaunty Wunderkind, Michelle Graham, and Otto Wagner

Description: This is a mobile web application intended for use on phones or tablets, mounted in-car, in hands-free configuration. It tracks the user's location ongoingly, and display's a "heads-up" view of whatever traffic intersection the user is headed towards. This view includes:

● A mirror visualization of the traffic light

● A count down timer for how long the current phase is expected to last

● A text description of the intersection of this traffic light

This application ongoingly polls the Smarter Roads' Signal Phase and Timing API, grabbing all real-time timing information that is available (presently, this is the Virginia Connected Corridor) and storing it into a geodatabase.

Link: https://devpost.com/software/smarterroads-org-show-me-the-next-traffic-light

Title: SmartPave (Smart systematic pavement management)

Prize(s): Resiliency Winner

Designers: Reza Vatani Nezafat and Behrouz Salahshour Description: Optimized road maintenance planning seeks solutions that minimize the life-cycle cost of a road network while maximizing the pavement quality. We propose a solution to find the best pavement schedules for different budgets. The formulation of the optimization model is carried out in such a way that a cost-effective maintenance strategy is reached by preserving the performance level of the road network at a desirable level.

Link: https://devpost.com/software/smartpave-smart-systematic-pavement-management

Title: Vi-Care Vulnerable Road Users Winner Designers: Qingyu Ma, Zhenyu Wang, and Hong Yang

Prize(s):

Description: It's a port that lets citizens report transportation problems they find. It also provides a management portal for VDOT managers to distribute resources in an efficient way.

Link: https://devpost.com/software/vi-care

Title: Web Application of Toll-based Route Guidance

Designers: Olcay Sahin and Gülsevi Başar

Description: Helps toll users to choose a route based on their departure time, targeted arrival time, and their budget

Link: https://devpost.com/software/web-application-of-toll-based-route-guidance Fairfax County Hackathon

Link: https://www.fairfaxcounty.gov/economic-success/transportation-mobility-hackathon

Title: eWalk First Place Winner Designers: John Estrada and Sara Khosravi Description: This design is a mobile application for blind pedestrians that lets their phone talk to traffic intersections and let the intersection know they are trying to cross, and then the pedestrians mobile phone lets the pedestrian know when it is safe to cross.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/etrans-pitch-presentation.pdf

Title: All Traffic Solutions Second Place Winner

Designers: Brendan Freehart, Chris Black, Briton Westerhaus, Michael Boyle, Andy Souders, and Kent Fullerton Description: Created a ranking system for safety of intersections in Virginia based on crashes and road conditions.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/traffic-solutions-pitch-presentation.pdf

Title: Qlarion

Prize(s): Third Place Winner

Designer: Jake Bittner, Adam Roy, DK Mukerjee, and Rob Howard Description: Helps agencies responsible for designing and maintaining infrastructure to keep up to date with road data and population trends. Link:https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/qlarion-pitch-presentation.pdf

Title: AI-supported Early Warning of Car Accidents in Fairfax County

Prize(s): Student Winner

Description: Uses past crash data and an AI algorithm that analyzes the data to predict trends in traffic accidents. This can then predict crash probability in the future.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/gmu-pitch-presentation.pdf

Title: Go Together

Designer: Kimberly Moore, Chong Liu, Kathy Xiong, Robert Sohn, and Adam Trent Description: Carpooling application for getting student to school.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/go-together-pitch-presentation.pdf

Title:

Designer: Amar, Ali, and Muhammad

Description: Helps vulnerable individuals by using a piece of video recognition hardware that can see what is around you can tell you what is happening. Recognizes other people, facilities, and locations.

Title: Zone Alert

Designer: Andrew Sweeney and VDOT team

Description: Alerts drivers of work zones and gives information based on where you are in the work zone and how to safely travel through it.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/vdot-pitch-presentation.pdf

Title: MULTI-AGENT SYSTEM AND DATA ANALYTICS

Designer: Monty Abbas

Description: Uses data gathering on driver data to accurately predict driving behavior so that connected and automated vehicles can better predict how other drivers will act.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/virginia-tech-pitch-presentation.pdf

Title: Fluxity

Designer: Nathan Byun

Description: In infrastructure installment that connects multiple cars data to cross check their input data and make sure connected and automated cars are all working properly.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/fluxity-pitch-presentation.pdf

Title: Edge360

Description: Want to use machine learning and simulations to create the most efficient traffic patterns and how to control them with infrastructure.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/edge360-pitch-presentation.pdf

Title: TIVP: Traffic Incident Visualization and Prediction

Designer: Hong Yang and Zhenyu Wang

Description: Collecting traffic data to create predictions for future incidents. Can be used by operators to predict potential incidents. Can also help the public by letting them know where potential incidents will occur and guide them around problem areas.

Link: https://www.fairfaxcounty.gov/economic-success/sites/economic-success/files/assets/documents/pdf/odu-pitch-presentation.pdf

Title: FlexiRoute (Hackathon 1st Place & Idea Jam: Resiliency Winner)

Designers: Krista Rand, Mahmoud Elnaggar, Austin Angulo, Wesley Daugherty, Xiaoxiao Zhang

Description: Flexiroute is a mobile app that allows users to search for alternate routes based on user-defined preferences.

Link: https://devpost.com/software/flexiroute

Title: Virginia Public Rest Area Truck Parking Information (Hackathon 2nd place winner) Designers: Atizaz Ali, Robert Kraig

Description: This app provides information on truck parking availability at Virginia truck rest areas.

Link: https://devpost.com/software/truck-parking-information

Title: Safety Assistant (Idea Jam: Safety winner)

Designers: John Jianyun Li, P.E. PTOE Description: The app alerts drivers to slow down or stop when the signal ahead is about to change to yellow by consuming SPaT data Link: https://devpost.com/software/safety-assistant

Title: CyCl.By (People's Choice Award winner)

Designers: Francisco Esteve, Rob McNamara, Ryan Castro

Description: Cycl.By is a biking companion app that aids bikers in traversing local areas safely and efficiently.

Link: https://devpost.com/software/cycl-by

Title: V-UTM

Designers: Yusef Trowell

Description: Virginia Unmanned Traffic Management (VUTM) is an app that uses state- provided data to monitor traffic in an efficient approach by using SmarterRoads to data to deploy drones. Using drones to oversee traffic can help predict phantom traffic jams and predict traffic issues before they arise

Link: https://devpost.com/software/v-utm

Title: NOVA6: Surviving Asteroids

Designers: Bruce Goldfeder, Viet Nguyen

Description: Ingests and applies a variety of VDOT data sources to include speed limit, crashes, lane closures, and road work to define a safety metric to be depicted in the UI.

Link: https://devpost.com/software/surviving-asteroids

Title: EEvacPlan

Designers: Atizaz Ali, Ali Khan

Description: Emergency Evacuation Planning (EEvacPlan) Framework - A dashboard (with a capability of developing a full-fledged app) is presented in this Hackathon which is comprised of dozens of open data sources that helps individuals and households to get answers to the most frequently asked as well as most important questions such as: Am I impacted by Hurricane Florence? Do I need to evacuate? Which shelter should I go to? Are road conditions clear or flooded? Is the route safe? Etc... The answer to all these questions through a single dashboard/app will help the impacted households to make sound decisions by utilizing the vital information at one place, based on accurate data fetched in real-time road conditions as well as other numerous sources.

Link: https://devpost.com/software/eevacplan

Title: AV Hotspots

Designers: Michael R. Boone, P.E.

Description: Create AV Hotspots with Existing Data. Demonstrates how Virginia can facilitate a real-world test bed with existing data, partners, and tools.

Link: https://devpost.com/software/av-hotspots-wham03

Title: Elite Safety

Designers: liu spencer (and team)

Description: A model based crash predictor. Every year, there's a huge monetary and personal loss to humanity, because of car crashes. So, when we heard about the hackathon, about the amount of data provided by VDOT and Smarter Roads, we as Computer Science students knew it right away, that we can contribute to this cause and decided to come up with a Machine Learning model to predict the number and the type of crashes.

In this design we used 789,914 car crash records to build a performance judging system to analyze the cause of each car crash and predict the number of car crashes on a particular road in future. To do this, we build a classifier and a regressor with machine learning techniques. The classifier was built on the crash records dataset using the Random Forest algorithm. When user, inputs the road features and real time conditions (like weather, time, etc..), 2000 estimators work to evaluate the possible cause of this crash. While the Classifier tell the user about the type of the predicted crash, the Regressor tells the user, the number of predicted car crashes in the future on a particular road. To build the regressor we cleaned and refined all the datasets and created a new dataset which records the crash and road statics of roads in Virginia. The regressor was built using linear regression algorithms. When user select the road and give the forecast weather in the next month, the regressor will return the expected crash numbers that will possible happen on this road in the near future. https://www.youtube.com/watch?v=WCv2RiQn6lc&feature=youtu.be

Link: https://devpost.com/software/elite-safety

Title: Traffic Congestion with Smarter Signal Lights

Designers: Kechen Liu, Akanksha Nichrelay , Jiayang Liu, Onyi Uche

Description: Dynamically re-distribute the duration of green-lights at intersections in order to reduce total wait time. Every day, time was wasted on roads at intersections because of the unreasonable distribution of duration of green lights. If the roads with more cars can have longer durations of green lights, people's time can be saved. Our model dynamically changes the duration of green lights according to some features (like the volumes of cars on road, the expected upcoming cars per second and so on) to minimize the total wait time at the scale of a city.

Link: https://devpost.com/software/traffic-congestion-with-smarter-signal-lights

Title: Lighthouse Logistics

Designers: Kevin Davies, Mark Hamilton

Description: •Web service for central reporting / querying of activity from IoT devices or mobile clients (similar to waze) with iPhone/iPad mobile app example with trip logging. •Cross-platform codebase deployable at any scale on Linux / macOS / Windows. •APIs for querying the gis data to extract meta-data for a given lat/long. •Real-time reporting and streaming data using SignalR.

Link: https://devpost.com/software/carpool-rewards

Title: A Safely Informed Motorist (ASIM)

Designers: Shayne Perryman, Ray Cook, Zacroe, Robert Cline

Description: This application can help improve the safety of motorists on the highways and Interstates.

Link: https://devpost.com/software/a-safely-informed-motorist-asim-l3fq98