



Communicate

Mark T. Faust, Alisa Yang, Zeyn Schweyk, Jaesun Lee, Dr. Ali Madooei
Computer Science Department
Johns Hopkins University

Introduction

Motivation. Driver fatigue is an issue that plagues millions of drivers and endangers hundreds of thousands of innocent civilians around the world each year. Drowsy driving is a grave issue that has been brushed under the rug and improperly addressed for too long. So, Commutate has stepped up to the task to solve it the *right way*. Ultimately, Commutate aims to rid roads around the globe of dangerous, drowsy driving in fun and effective ways!

Methods. Driver fatigue has not been appropriately addressed, until now, because of the stigma around technology usage within the cockpit of a car and an absent understanding of the root cause of driver fatigue. Solutions that currently exist fail to mitigate driver fatigue because they are either untargeted and/or outright ineffective. Most “targeted” solutions are *reactive*, meaning the driver must have already reached a drowsy state before any assistance is offered. Commutate takes a *preventative* approach to ending driver fatigue by ensuring that the driver never even enters such a state. This is achieved via the procurement of a variety of interactive media to keep drivers’ minds engaged and alert.

Results. Commutate is still within its development stage and has been primarily focused on engineering its initial Minimum Viable Product (MVP). So, the majority of time this past semester has been spent on determining which technologies would best serve our purpose and mission. Nonetheless, a bare-bones implementation with minimal features has been completed!

Total Addressable Market

Commutate’s primary intention is to serve and save drivers that experience driver fatigue: the physical and mental exhaustion felt by individuals while operating a vehicle for extended periods of time. Drowsy driving occurs as frequently as you may imagine, and its repercussions, both physical and economic, can be beyond severe:

- Approximately **328,000** drowsy driving crashes occur annually, **109,000** of which resulted in injury and **6,400** of which in fatality.
- It has been shown that even with plenty of rest, **70%** of experiment participants who were tasked with performing a continuous tracking activity, such as driving, for 50 minutes straight experienced “microsleep” episodes of between **0.5-15 seconds**.
- The National Highway Traffic Safety Administration (NHTSA) estimates fatigue-related car crashes that result in injury or death cost society around **\$109 billion** annually, not including property damage.

While Commutate is primarily intended for the drowsy driver, it’s utility is ultimately meant to extend to even the non-drowsy, non-driving audience:

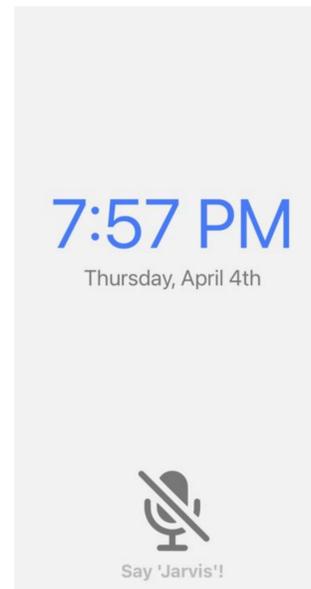
- About **86%** of working individuals drive to work everyday, totaling around **123 million** in the United States *alone*.
- Worldwide, there are roughly **1.5 billion** total multimodal commuters.

Technology Stack

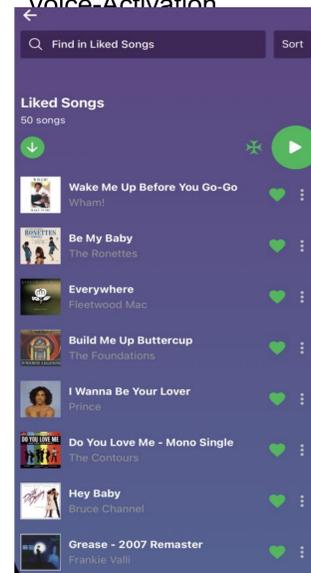


Commutate’s goal is to create a product that has never been created before; an all-in-one entertainment and engagement platform that serves the needs of commuters of all shapes, sizes, and speeds. This means that Commutate must orchestrate a novel selection of technologies to satisfy our customers and truly enhance their commuting experiences.

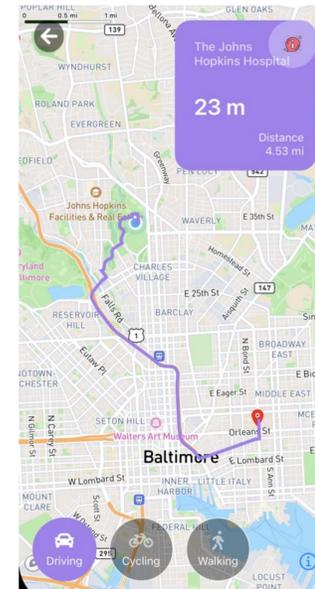
User Interface



“Jarvis”
Voice Activation



Spotify Integration



MapBox Navigation

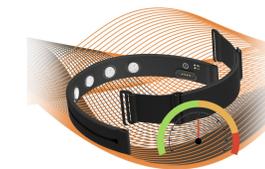


Interactive Media

Serious consideration went into deciding which tools would best equip Commutate to build the extremely capable mobile application that it has set out to. Commutate is fully voice-activated, utilizing Wake Word and Intent Detection ML kits; features an elegant navigation interface, capitalizing on highly-capable and customizable Map API’s; and an extensive entertainment hub, integrating with a number of the most popular open-source API’s.

Competition

Microsoft (TomTom) is one of Commutate’s closest competitors. Their aim is to create AI that allows drivers to better interact with and utilize their vehicle’s on-board technology. Commutate is a mobile application that can equip *any* commuter, regardless of their chosen vehicle, with a personalized AI copilot. Commutate can also, uniquely, connect drivers with others that are also interested in active conversation.



SmartCap is another competitor that produces a hardware device capable of analyzing human brain activity and detecting signs of mental fatigue. This product is primarily used within the construction vehicle operation industry, and is therefore not a direct competitor. Additionally, SmartCap’s headband is a *reactive* solution, unlike the Commutate app.

Nauto is one of the most powerful dash-cams ever created. Equipped with AI, it is capable of not only viewing the road ahead but also the driver’s face and posture. Nauto raises alerts when an accident may be imminent but is geared for the commercial trucking industry and is yet another *reactive* solution. Plus, it isn’t nearly as engaging as *Commutate!*



Conclusions & What’s to Come

The Commutate team quickly discovered that creating a non-trivial mobile application would require the transition to a more-complex tech stack. While this gave rise to a separate set of issues, the move was a necessity for the future success of our application. Commutate will be charging forward through the JHU FastForward U Summer Incubator, raising capital for its expansion and releasing its MVP within the next few months. So, stay tuned!

Feedback & FREE Beta Access!

As a “Thank You” for your attention, Commutate would love to offer you *exclusive* access to our beta software as soon as it is ready for release in app stores! Commutate is striving to provide *all* commuters and everyday movers with the premium experience that they deserve, so the importance of your input cannot be understated. Now, scan our QR code to secure early access to the world’s first commuting AI copilot today; “*Don’t wait to Commutate!*”





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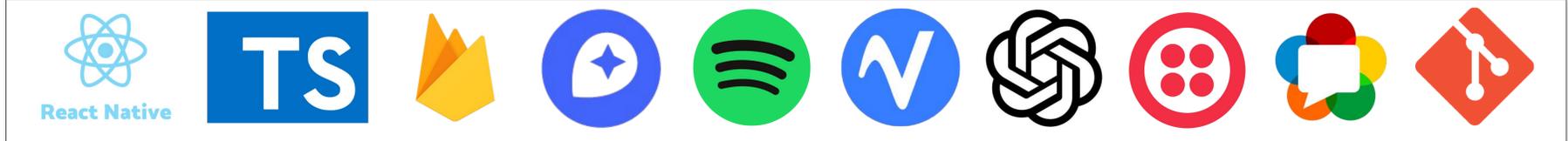
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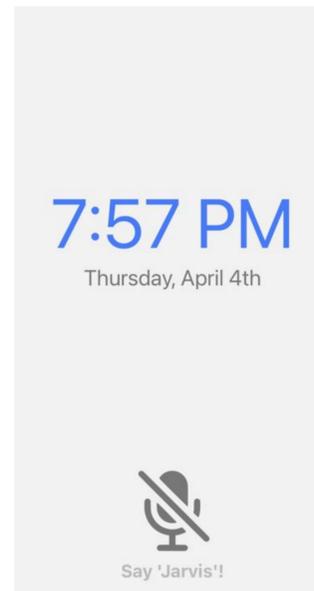
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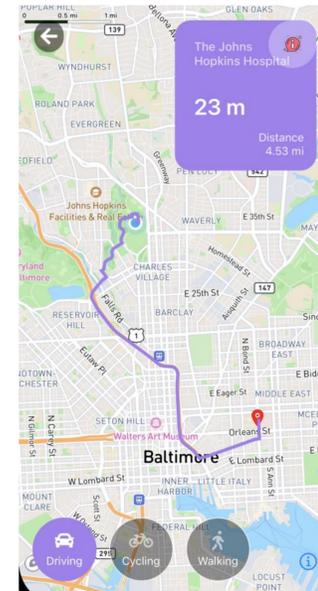
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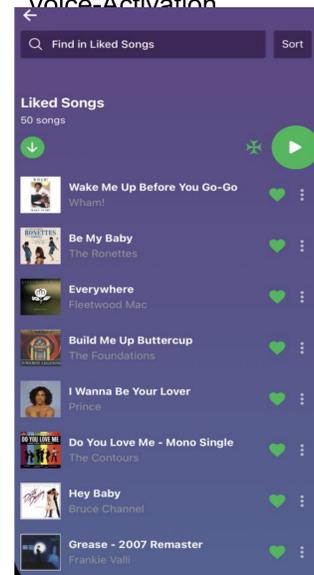
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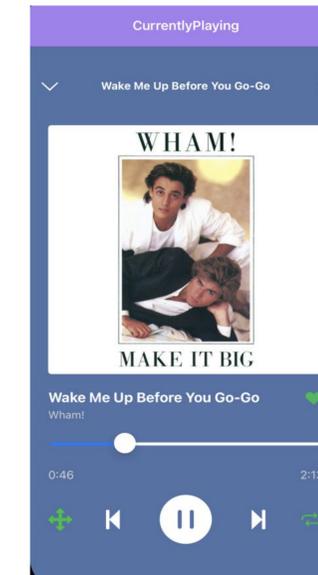
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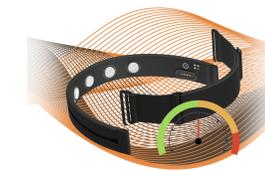
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Abstract

The goal of the abstract is to summarize the whole poster in one place. You do not have to squeeze every fact in here; focus on the most important points only. It can help to give the abstract a structure, such as:

Motivation. Briefly describe the context and background to this work.

Methods. Describe the important techniques relevant to this study.

Results. Summarize the observations that you've made (what you are about to talk about!)

Introduction

Give a more detailed description of the background. Focus on background that is necessary for a person not directly in your field to understand your presentation. Avoid unnecessary jargon, and make the writing as clear as possible.

Including schematics here can be very helpful.

Note: The text on the poster should use a sans serif font, it is easier to read from a distance. Don't decrease font size below 28 on a 3' x 4' poster, it will get hard to read but also too much text to read.

Make sure to keep a margin of at least 0.5 inches or 1 inch around the edge of the poster

Some detail on methods that are not common (obviously change these titles!)

Beautiful schematic imagery here
(just an example – arrange figures and text as you wish)

Use this methods section to focus on your specific contribution to the project. What methods did you personally use? Did you make modifications to a typical method or create something new? What was the sequence of your analysis?

More description here.

Results part 1 (adapt the titles!)

Briefly describe the results – use only as much text as is necessary to illuminate the figures you present. Make the figures big and easy to read, and set out in a logical sequence. Use more or fewer title bars or columns as appropriate to the type of figures you have.

Beautiful results images here

Beautiful results images here

Beautiful results images here

Results part 2

You can put your text beside your figure, above it, below it... most importantly, it should be really obvious to the reader which text matches with which figure.

You can even use arrows or other methods to point out specific features like this letter 'e' right here

Beautiful results images here

Clarity is paramount. When in doubt, err on the side of less clutter, fewer words and larger images.

Conclusions

Summarize the conclusions of your study. What are the take-home messages for the reader/viewer?

Additional Questions?

Provide your preferred contact information. If you use twitter – which is widely used in science communication – give your twitter handle here, so people can use it to refer to your work. If you have a website, use a QR code to make it easy to reach. Make sure to replace the QR code on the right! You can generate QR codes at <http://www.qr-code-generator.com/>

