# HIC Project 1 – Smart Car Interface Application

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Purpose:

The purpose of this application is to serve as an interface between a “smart” car and a driver. A smart car refers to the new generation of automobiles whose flagship features often include self-driving, fully electric power, and maximum onboard computer integration. Inspiration for the design and interface comes from today’s Tesla cars. The aspect ratio of the central interface itself is modeled after the 17-inch center display of the Tesla Model X. This application will oversee handling most of the range of interface options a driver has when operating a smart car, from climate control to audio streaming to navigation. This application will be responsible for handling both the driver and central dash displays.

We are building this application because an efficient, simple, and driver-friendly interface is extremely important to accommodate for the increasing feature control associated with modern cars without distracting the driver from the road.

# Home Screen:

The purpose of this screen is to act as the first screen that users see. This screen will allow navigation to all other locations. It is also meant to be able to handle having all the information that a driver might need even while he/she is managing multiple features simultaneously.

The map at the top will have a live map running and directions on the side. The other buttons below are links to the other screens, and then the essentials bar will have access to go home and to music and heating and cooling.

The 8 golden rules that apply are:

**Consistency** in the buttons shapes and outlines as well as with the overall color palette and placement of main content and the essentials bar.

There are **shortcuts** for playing and pausing music and heating and cooling.

**Reducing short term memory load** because the buttons are big and there are only five of the main ones.

You can easily go home at any time from the essential bar, so there is a **reversal of actions.**

This screen serves as an **internal locus of control** that lets users guide the process.

There would be **informative feedback** such as the play button turning to a pause and vice versa as well as the page changing when they go to a certain location. In addition, the application will play a clicking sound when any valid button press is registered.

# Phone Contacts:

The purpose of this screen is to allow the user to see their phone contacts that they have set up with their car and choose to voice message, call, or delete them from the display screen. We still have the essentials bar as well.

The 8 golden rules that apply are:

**Consistency** in the buttons, shapes and outlines as well as with the overall color palette and placement of main content and the essentials bar. Each contact is consistent in style and arrangement.

**Reducing short term memory load** because there are very few options that we allow a user to do with the phone contacts. Alternating colors also allow easy distinctions.

Calls can easily be cancelled or hung up at any time, so there is a **reversal of actions.** Additionally, any changes made to a contact can be reverted.

This serves as an **internal locus of control** that lets users guide the process.

There is a confirmation **dialogue box to yield closure** that appears for this screen when you click to call or message.

There would be **informative feedback** such as the play button turning to a pause and vice versa as well as the page changing when they go to a certain location. In addition, the application will play a clicking sound when any valid button press is registered.

# Stats Screen:

This screen is meant to act as a place to check statistics about your car such as tire pressure, battery life odometer, and other statistics.

The 8 golden rules that apply are:

**Consistency** because the color scheme, layout of the screen, essentials bar, and the image used for the car representation are consistent with the rest of the application.

You can easily return to or leave this screen from the essentials bar, so there is a **reversal of actions.**

**Reducing short term memory load** because there are very few options, and everything is clustered such that it is easy for the user to get the specific statistics information he/she is looking for.

There is **informative feedback** because the application will play a clicking sound when any valid button press is registered.

Audio Screen:

The audio screen serves as an enhanced and more powerful interface for audio-related settings. A basic media player interface that allows the driver to control the volume and current song playing will be present from all screens, but this screen specifically presents more information and control, such as playlist selection and sound settings. This page is accessible from anywhere in the application by clicking on the currently song playing or by navigating to it through the home screen.

The 8 golden rules that apply are:

**Consistency:** The color scheme is consistent with the rest of the pages. The essentials bar is in the same locations as other screens and has an identical layout.

**Support internal locus of control:** This page allows for advanced manipulation of audio-related settings and serves as a locus of control for such settings.

**Reduce short-term memory load:** This page does not ask the user to remember anything except the relative location of buttons, which remains consistent. The current song playing is always displayed so that the user does not have to remember the name of the song or album.

**Permit easy reversal of actions:** Every action on this page can be easily reversed with a single button click or setting change. A skipped song can be returned to, the bass/treble intensity can be re-adjusted, and the page can be easily accessed from the home screen if it is left.

**Offer informative feedback:** This application will use a touchscreen interface in a real environment. To make this touchscreen sensible and keep the driver’s eyes on the road, every valid click on the screen which successfully creates action will be accompanied by a “click” sound.

Settings Screen:

The settings screen is where general settings related to the smart car will be manipulated. Any settings which intuitively make sense on other screens will be placed on those screens as well, but regardless this screen will allow access and manipulation of every setting which the user is permitted to interface with.

The 8 golden rules that apply are:

**Consistency:** The color scheme is consistent with the rest of the pages. The essentials bar is in the same locations as other screens and has an identical layout.

**Offer informative feedback:** This application will use a touchscreen interface in a real environment. To make this touchscreen sensible and keep the driver’s eyes on the road, every valid click on the screen which successfully creates action will be accompanied by a “click” sound.

**Permit easy reversal of actions:** Every action on this page can be easily reversed with a single button click or setting change. All setting toggles can be reset and anything which is altered can be reverted. This page can be easily returned to from the home screen if accidentally exited from.

**Support internal locus of control:** This page serves as the central locus of control for the entire application. Every general setting and/or adjustment which can be made in this application is accessible from here.

Driver Dashboard:

This screen is different from the other screens in the following ways: it appears on a separate screen behind the steering wheel instead of on the central console and persists regardless of what state the central console is in. In addition, this screen serves as the traditional dashboard for the driver and displays things such as battery level (assuming this is an electric car), current speed, current speed limit, fuel economy, the current song playing, and other features. Things that appear on this screen are contextual to the state of the main application being interfaced from the central console, the controls on the steering wheel of the car, and the state of the car itself.

The 8 golden rules that apply are:

**Consistency:** The color scheme is consistent with the rest of the application.

**Permit easy reversal of actions:** Any input which is applied to this screen can be reversed immediately. Windshield wipers can be turned on/off, cruise control can be freely toggled, etc.

**Support internal locus of control:** Following the general theme of the rest of the application, this screen (corresponding to the controlling steering wheel) allows for control of the more mechanical-oriented features of the car, such as the gas/brake, steering, windshield wipers, headlights, etc.

**Reduce short term memory load:** The immediate and important state of the car, such as the current speed, whether high beams are on, if cruise control is set, and other things are immediately visible from this dashboard. The user does not have to remember how fast the car is going or what important features are turned on or off.

Map (Navigation) Screen:

The map (or navigation) screen is the primary location in which the driver or other users in the car can interact with the onboard navigation system. The map itself, oriented with the vehicle and tracking the vehicle’s current position, is placed at the top, easily viewed by the driver while causing minimal distraction away from the road ahead. Detailed text-based instructions as to the next few actions that will be taken are listed (chronologically) below the map itself. Finally, there is the lower section in which new destinations can be set or selected from a list of “favorite” locations, for increased ease-of-use and safety if this must be done while driving.

The 8 Golden Rules that apply are:

**Consistency:** The general layout and color scheme are consistent with the rest of the application. The essentials bar is located at its typical location for easy access by the driver if needed.

**Shortcuts:** The favorite destinations section allows for frequently desired locations to be most easily set and used by the driver.

**Informative Feedback:** As with other interfaces of this system, it is important to not rely exclusively on visual feedback. When a destination is selected, an audio prompt will be played to confirm that the routing has begun. Additionally, a sound will be played on any valid button pressed to help keep the driver’s eyes on the road.

**Dialogue to Yield Closure:** When taking actions such as ending the current route, the user will be prompted with a confirmation dialogue to ensure that this is their actual desired course of action and not a mistake. This prevents accidentally (or unknowingly) canceling the navigation without proper confirmation.

**Internal Locus of Control:** This screen provides robust control over all navigation features the smart car provides.

**Reduce Short-term Memory Load:** With the essentials bar and the functionality of the favorite destinations, the desired information from this page is never more than a few inputs away. This is especially important because the focus of the driver user should be directed elsewhere to maintain driving safety.

Backup Camera:

The backup camera is an automatically activated view in the central interface that allows the user to view the perspective of rear-facing cameras on the vehicle to aide in reversing. This screen would be automatically switched to upon the user shifting into reverse, as this is the only notable time that it would be used and should not need a button press to reach this view. The camera view is located at the absolute top of the central display, most easily in the view of the driver without diverting attention too far from the front windshield, even when reversing. Additionally, lower on the page is a more extensive proximity sensor view. This can help especially in complicated parking scenarios where proximity to other objects/vehicles in the surroundings is especially important.

The 8 Golden Rules that apply are:

**Consistency:** As with the other views, the color scheme is identical, leading to familiarity. Additionally, the most important view (the rear camera feed) is located at the top of the display, much like other views such as the home screen or map screen.

**Informative Feedback:** Most importantly, this screen provides a live camera feed of the back of the vehicle. Audio feedback cues could be used to further assist the driver in backing the vehicle into position. For example, in addition to visual indication on the proximity sensors, audio beeping could indicate the severity of the proximity to nearby objects/vehicles.

**Permit Reversal of Actions:** As this screen will be switched to and from automatically when the car enters/leaves reverse, it will be useful to preserve the user’s previous actions. This especially includes remembering the previous screen that the user was interacting with before starting to reverse and reverting to that screen when the driver shifts away from reversing.