

Creating an **android**auto app

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Introduction

What is Android Auto?





Mobile app that mirrors features from an Android phone to your car's head unit



500+

Compatible vehicles and aftermarket stereos

3 Types of Apps on AA

- ▶ Media
 - ▷ Music, radio, audiobooks, etc.
 - ▷ Spotify, Audible, iHeartRadio
- ▶ Messaging
 - ▷ Notifications, read/send messages via voice
 - ▷ Hangouts, WhatsApp, Telegram
- ▶ Navigation
 - ▷ Google Maps, Waze





Limitations

- ▶ Only these three categories of apps.
- ▶ Cannot distribute navigation apps via Google Play Store

Terminology

- ▶ Head unit/infotainment system - system that provides many functions for a car; usually located as a screen in the center of the car



SWOT Analysis

Strengths, Weaknesses,
Opportunities, Threats



Maps



Spotify



Exit



Amazon M

Strengths (AA)

- ▶ Many supported cars
 - ▷ Aftermarket stereos or on-phone app if not available
- ▶ Wide selection of popular apps
- ▶ Car software is kept clean

Strengths (AA)

- ▶ Less distracting than built-in infotainment systems
- ▶ Compared to:
 - ▷ HondaLink (Honda)
 - ▷ SYNC 3 (Ford)
 - ▷ MyLink (Chevrolet)
 - ▷ UVO (Kia)
 - ▷ Uconnect (Ram)

Strengths (Developing)

- ▶ 'Easy' to code, very similar to developing for phone/tablet
- ▶ Requires Android Studio
- ▶ Test on emulator, AA head unit, or phone

Weaknesses (AA)

- ▶ Small variety of type of app
- ▶ Poor phone-only app experience



Weaknesses (AA)

- ▶ Detrimental to attention and dangerous while driving
- ▶ Similar to using phone
- ▶ Slower driving speeds
- ▶ Most dangerous with touchscreen interaction

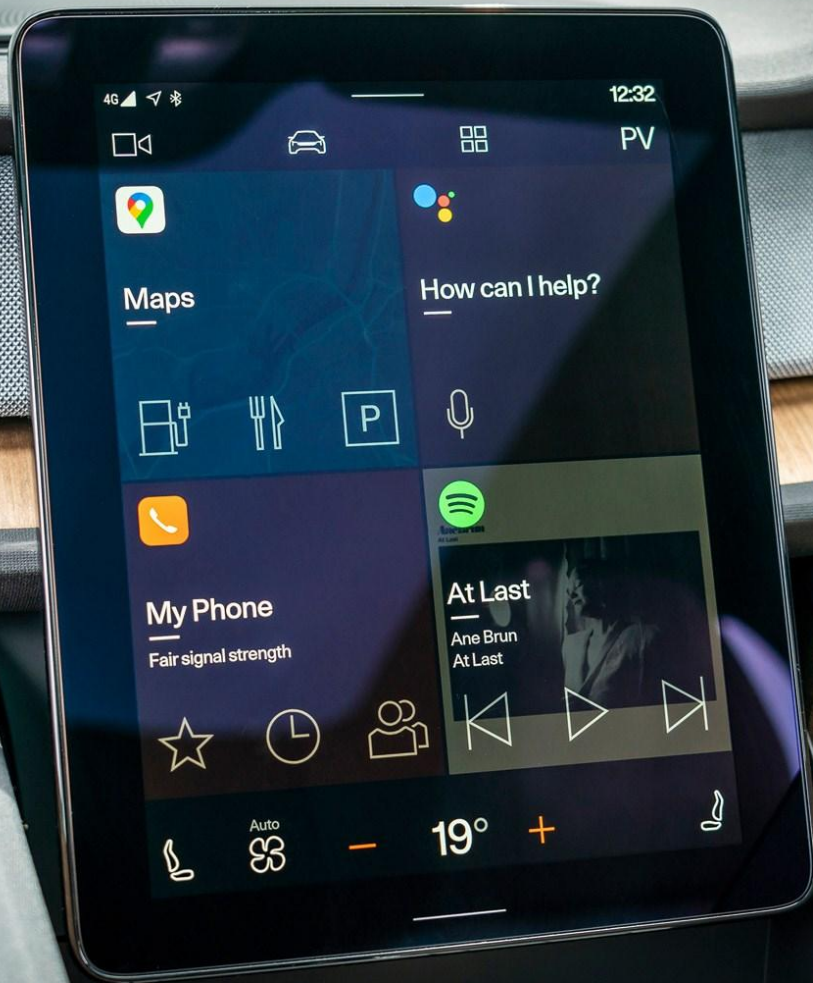
Weaknesses (Developing)

- ▶ Limited to three types of apps
- ▶ Flow of apps are different than traditional
- ▶ Navigation category is in beta

Opportunities (Android Automotive OS)

- ▶ Full infotainment system built into vehicles
- ▶ Apps mostly fit between AA and AAOS
- ▶ Available right now on Polestar 2
- ▶ Soon on:
 - ▷ Renault-Nissan-Mitsubishi Alliance
 - ▷ General Motors
 - ▷ Groupe PSA (in America, FCA)
 - ▷ Ford/Lincoln





Threats (Apple CarPlay)

- ▶ Apple's in-car phone mirroring system
- ▶ Higher requirements
 - ▶ Xcode, Apple Developer Program
 - ▶ Entitlement
 - ▶ Templates from entitlement
- ▶ Minor differences
 - ▶ Siri vs Google Assistant
 - ▶ More app type variety on ACP
- ▶ AA is slightly less distracting



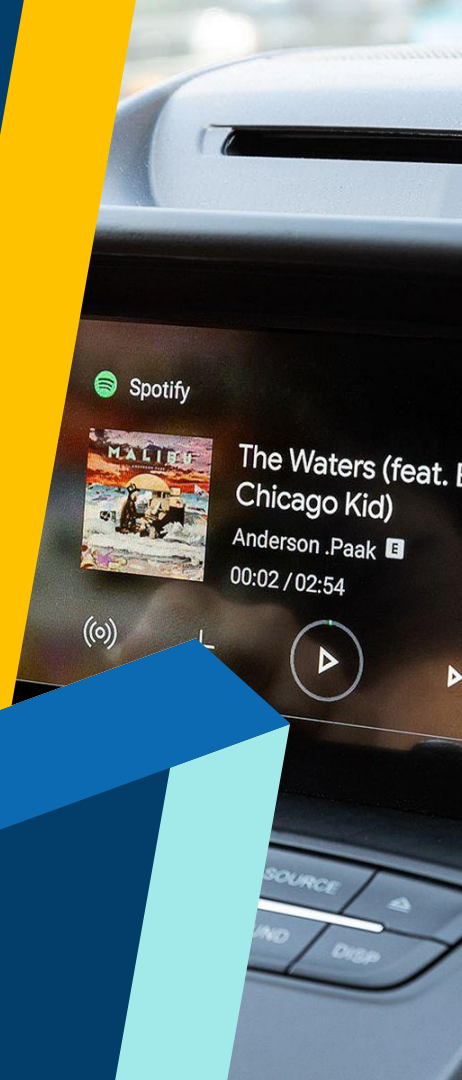
Threats (Built-in)

- ▶ Wildly different in quality
- ▶ Higher quality systems can offer better features than AA/ACP
- ▶ May come with AA and/or ACP



3 Developing AA Apps

For Dummies



Rough Steps

- ▶ Choose which category
 - ▷ Media
 - ▷ Messaging
 - ▷ Navigation
- ▶ Develop
- ▶ Test
 - ▷ Desktop Head Unit (DHU) and phone
 - ▷ Set up an alpha test for AA-supported cars

Adhering to Guidelines

- ▶ Following Google's guidelines is extremely important to reduce distractions
- ▶ <https://developer.android.com/docs/quality-guidelines/car-app-quality>

Media App Flow

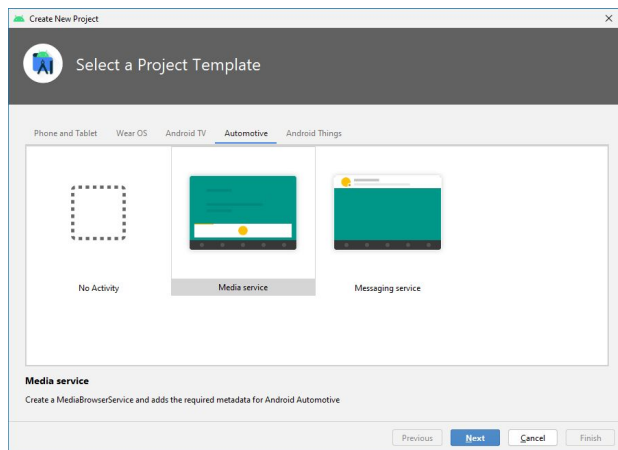
- ▶ Launch app on AA
- ▶ onCreate()
 - ▶ Create and register `MediaSessionCompat`
- ▶ onGetRoot()
 - ▶ Root media item in content hierarchy
- ▶ onLoadChildren()
 - ▶ Children of root media
- ▶ onLoadChildren() again if selecting a browsable media item
- ▶ Media session callback if selecting a playable media item
- ▶ onSearch() if searching

Messaging App Flow

- ▶ App receives message
 - ▶ Generate MessagingStyle notification
 - ▶ Reply & Mark-as-read Action
 - ▶ AA receives its own notification
 - ▶ MessagingStyle, Reply, Mark-as-read
 - ▶ AA makes notification in car
 - ▶ Using touchscreen, mark-as-read event
 - ▶ Using voice, reply event
-
- ▶ Must make an entire messaging app first

Navigation

- ▶ Read more at:
<https://developer.android.com/training/cars/navigation>
- ▶ Currently in beta



4 Lab Assignment

Homework was required by Dr. Plaue

