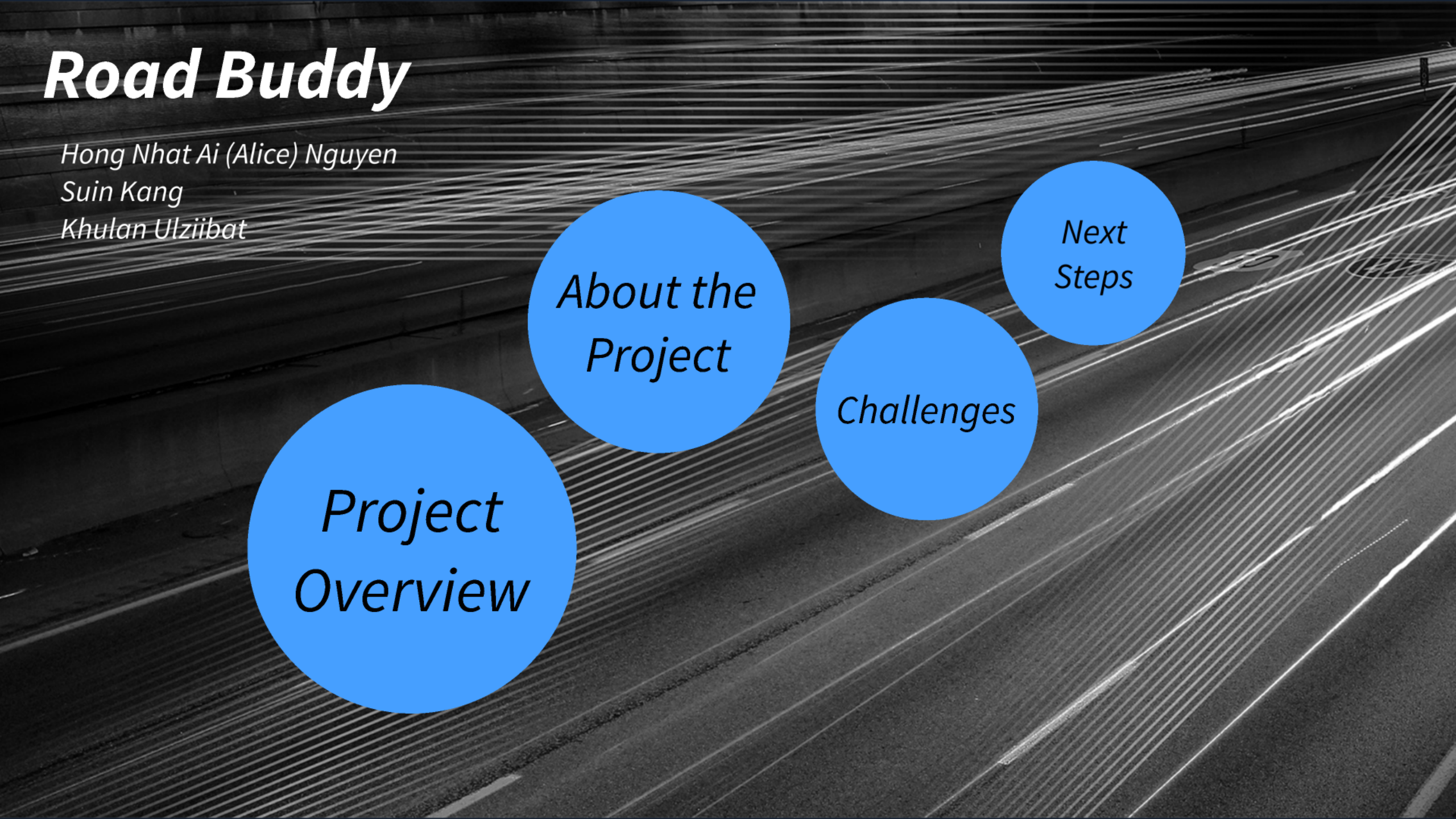
Road Buddy

Hong Nhat Ai (Alice) Nguyen
Suin Kang
Khulan Ulziibat



Project Intro

"Drive Safe, Stay Alert with Road Buddy"

- Your Accident Prevention Companion

Our Team

Goals

Our Team

- Hong Nhat Ai (Alice) Nguyen
  - Concordia University, Computer Science
- Suin Kang
  - Concordia University, Computer Science
- Khulan Ulziibat
  - Concordia University, Computer Science

Goals

- Contribute to the vision of zero crashes by help preventing road accidents
- Help drivers to stay more alert
- Save people's life with one alert at a time

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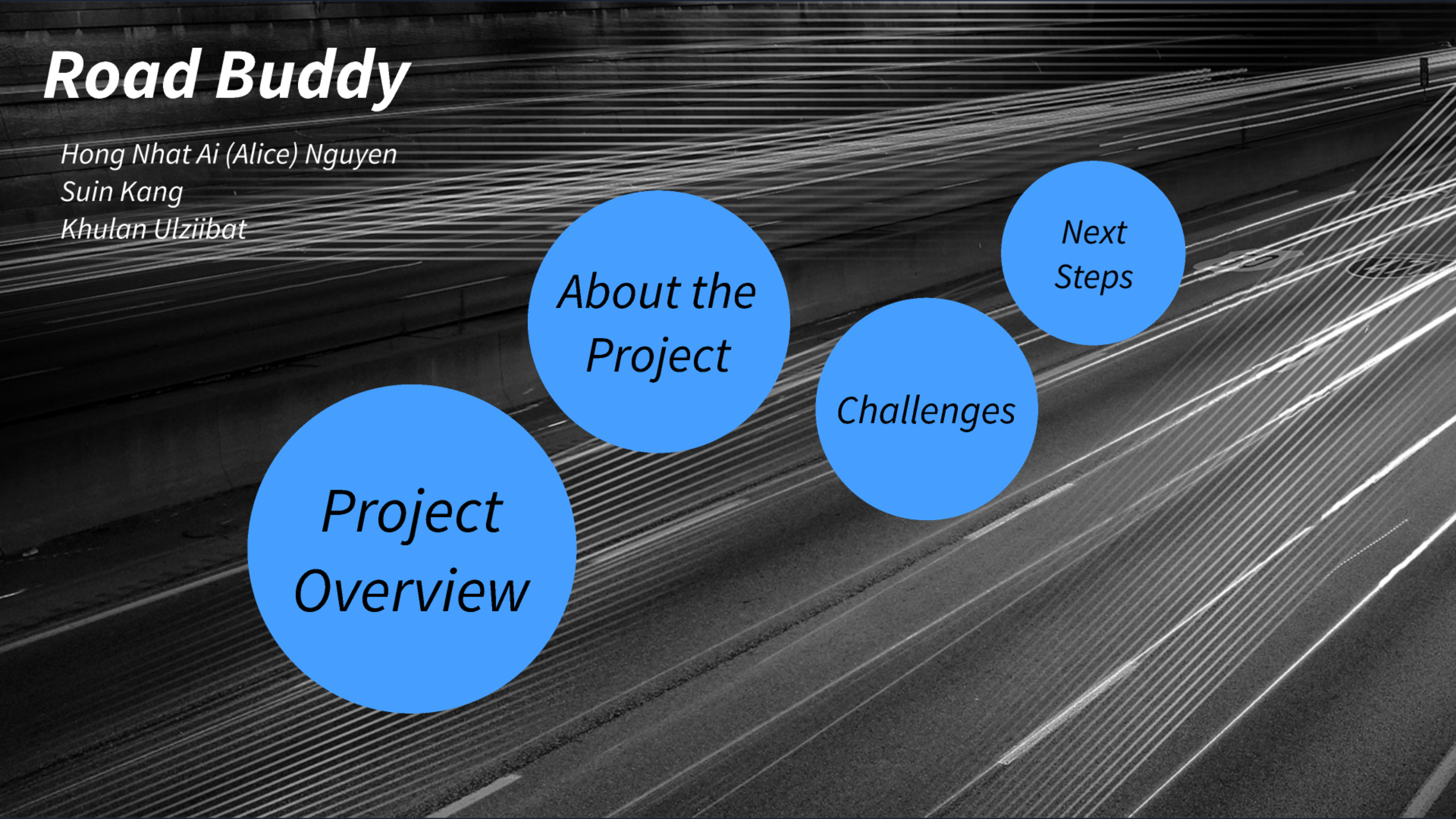
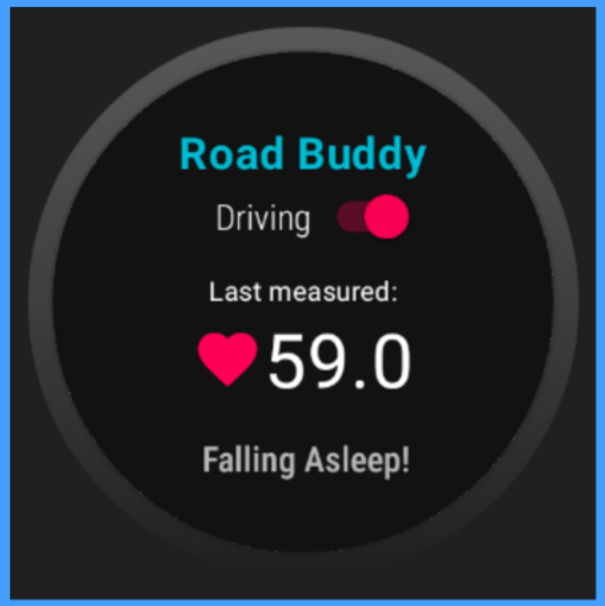


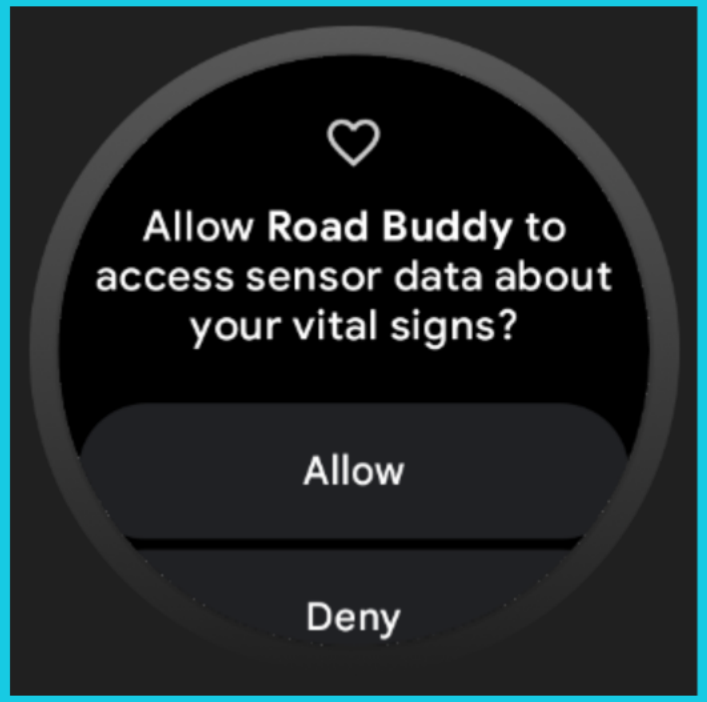
Current Status

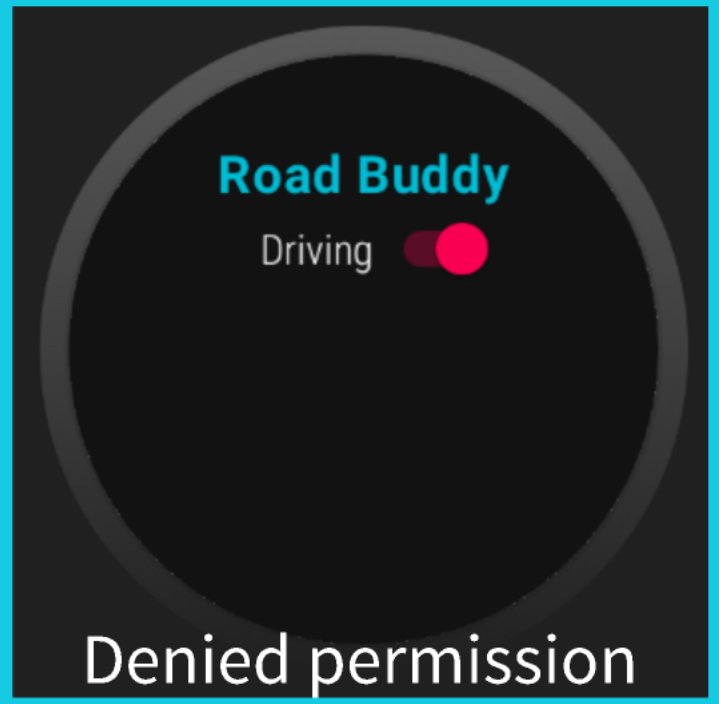


1. Enable the app before driving
2. Get heart rate measurements
3. Detect decrease in heart rate corresponding to driver falling asleep
3. Alert the user with vibration to wake up

Images

Background





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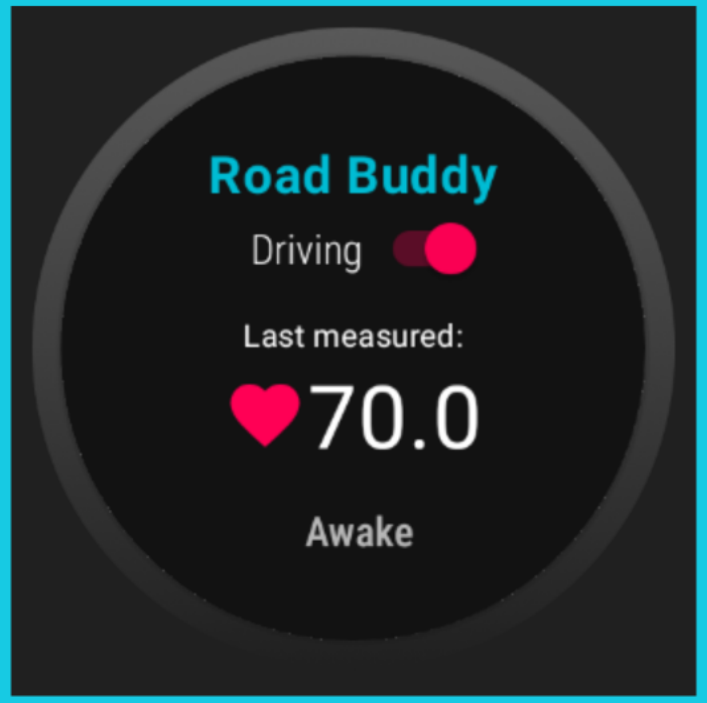
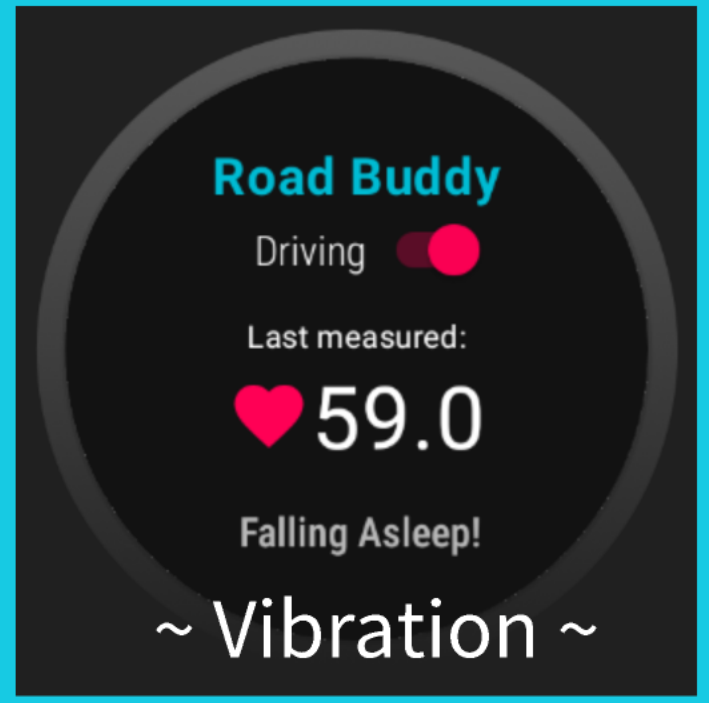




~ Vibration ~

Background

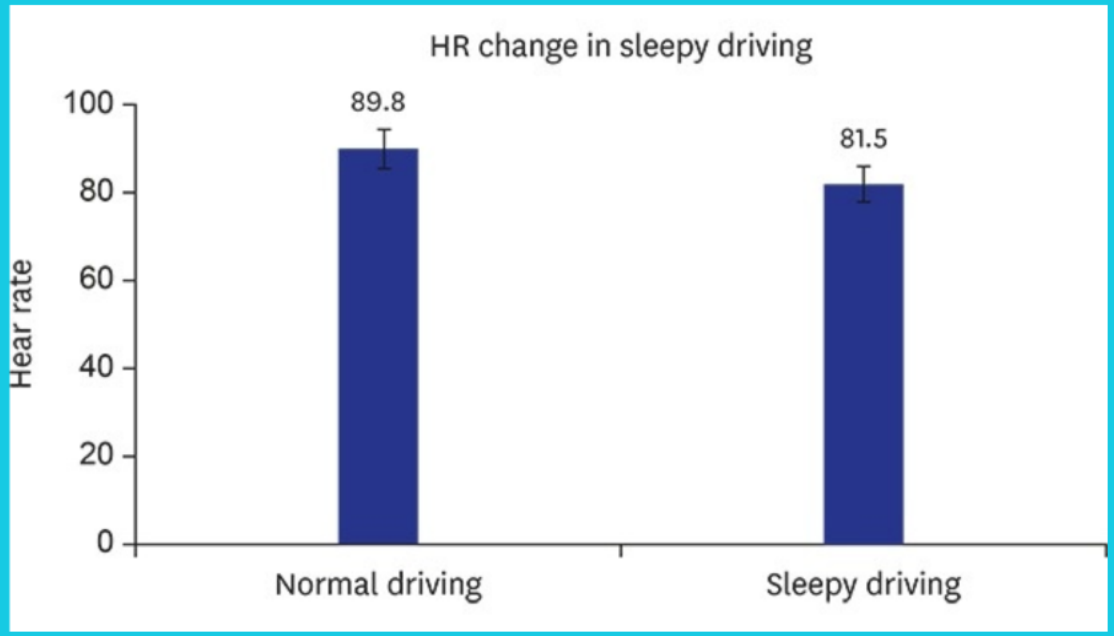
Contributing Factors in Fatal Collisions - 2016 to 2020

Contributing Factor	2016	2017	2018	2019	2020
Distraction	23.3%	22.3%	21.6%	20.3%	22.3%
Speed / Driving too Fast	26.2%	23.9%	25.4%	22.1%	25.3%
Impaired / Under the Influence	26.3%	26.2%	27.1%	15.4%	17.6%
Fatigue	3.8%	4.0%	3.3%	3.5%	2.5%
Other Human Factor	39.9%	39.1%	40.1%	38.5%	41.5%
Environmental Factor	20.5%	22.6%	23.9%	20.8%	21.4%
Vehicle Factor	5.3%	4.6%	3.6%	4.2%	4.3%
No Contributing Factors	31.8%	26.2%	26.4%	24.0%	25.9%

Source: Transport Canada, Canadian Motor Vehicle Traffic Collision Statistics: 2020

Heart Rate Change While Drowsy Driving

Source: Jo SH, Kim JM, Kim DK. Heart Rate Change While Drowsy Driving. J Korean Med Sci. 2019 Feb 12;34(8):e56. doi: 10.3346/jkms.2019.34.e56. PMID: 30833880; PMCID: PMC6393761.



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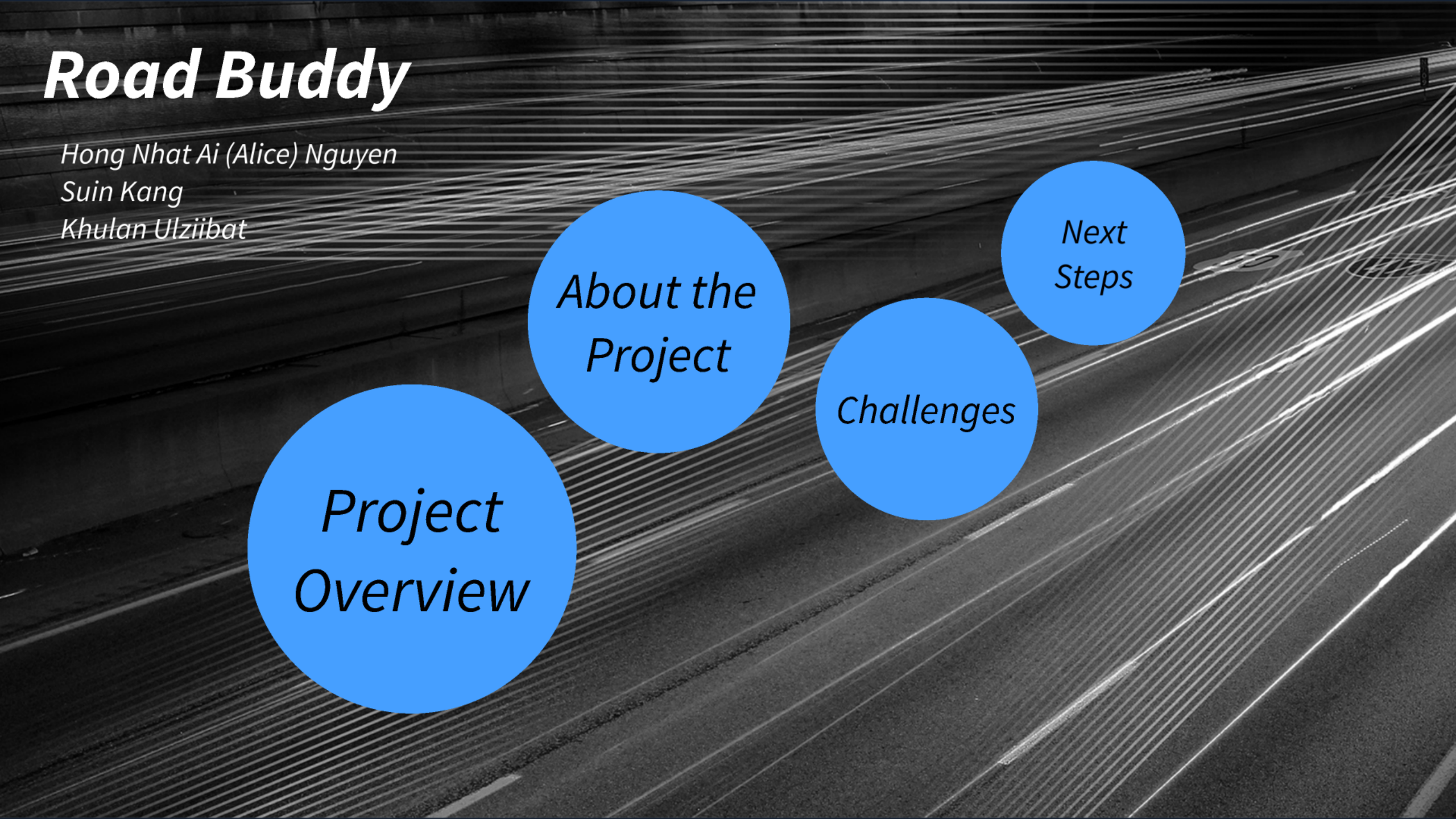

Challenges Summary

1

Challenge 1

First time in Android and Wear OS development

2

Challenge 2

First time coding in Kotlin

3

Challenge 3

Had to start from scratch to build everything

4

Challenge 4

Lots of research involving Android Wear OS API usage

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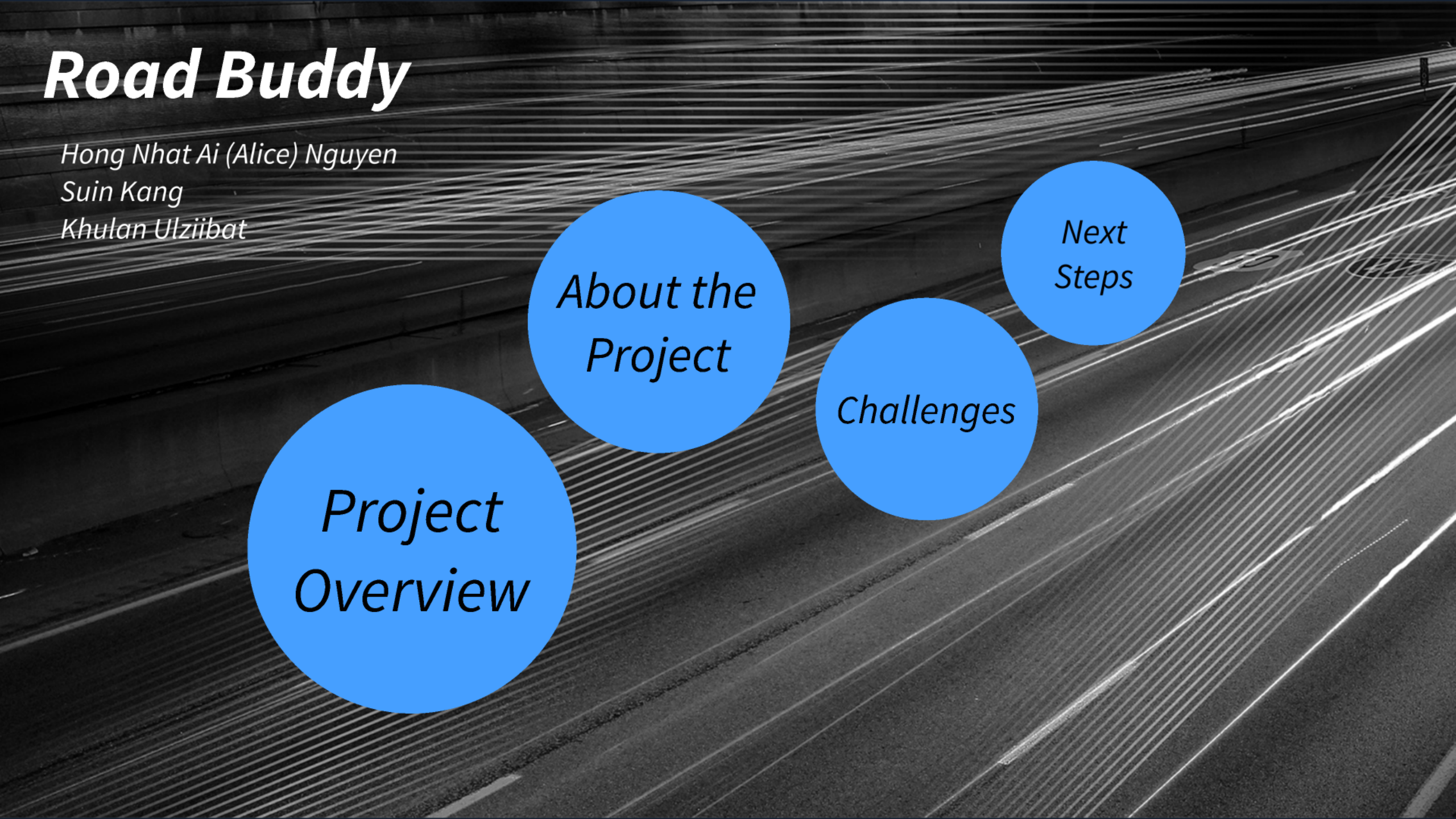

Next Steps

- Provide more accurate predicition of sleepiness
- Add voice alert on top of the vibration
- Obtain speed data and use API like Google Map's Roads API to get information about speed limit based on geographic location
- Notify user of speed limit and if they exceed the limit
- Find and suggest rest stop nearby to take a rest
- Connect with the car system and let autonomous drivign take control

References

Thank you!

References:

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- https://developer.android.com/training/wearables/apps/standalone-apps
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- https://developer.android.com/training/wearables/health-services/synthetic-data
- https://developer.android.com/reference/android/os/VibrationEffect
- https://github.com/android/health-samples

Thank you for your journey with Road Buddy !