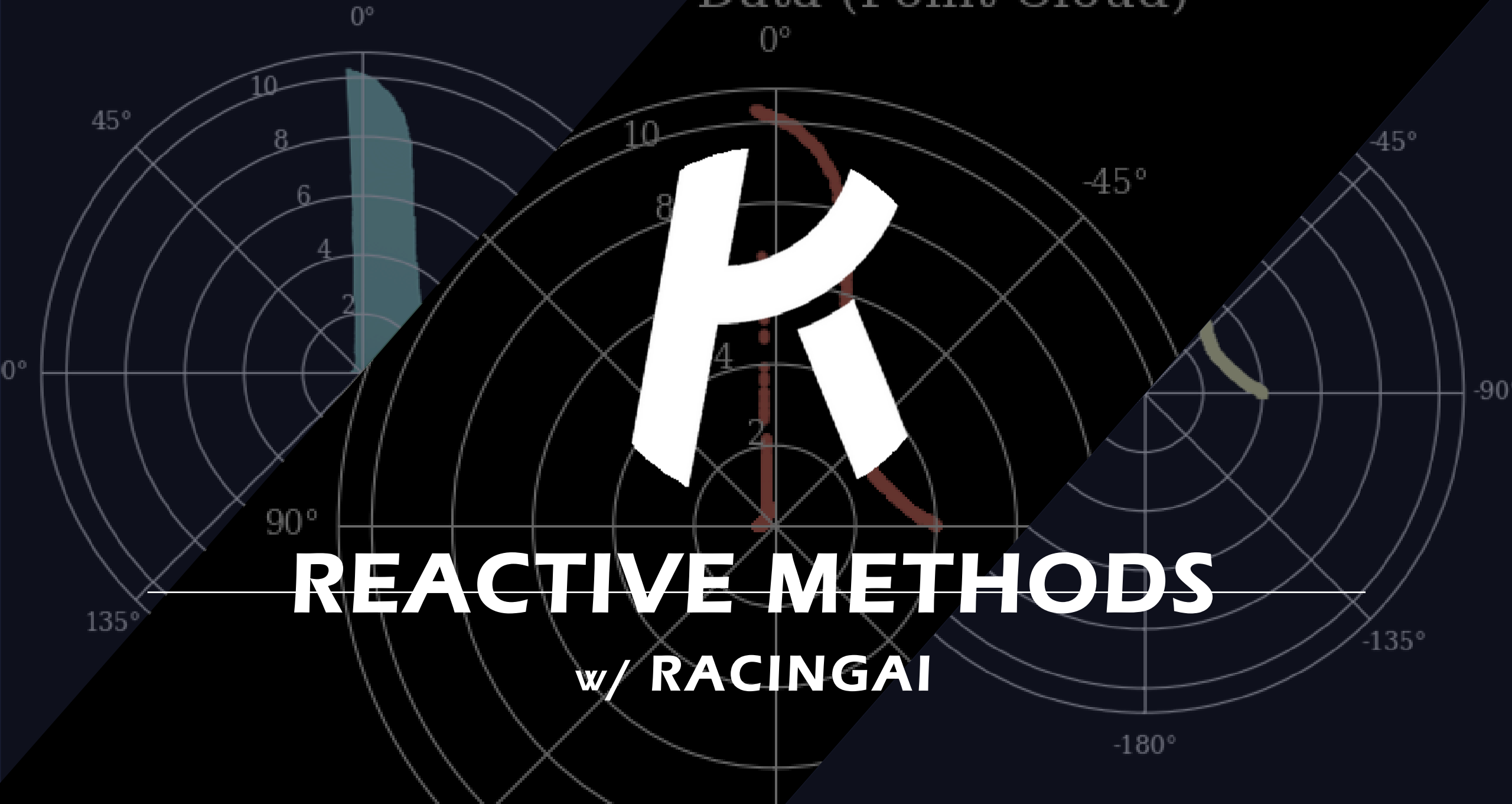


LiDAR Scan Data (Filled)

Data (Point Cloud)



**K**

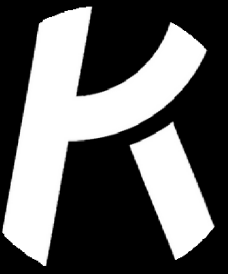
**REACTIVE METHODS**

w/ **RACINGAI**

# Pull This Repo !!!

<https://github.com/RacingAI/Reactive-Methods-Workshop>

---

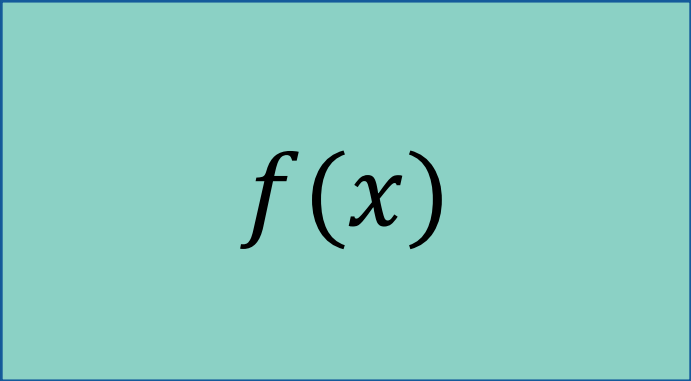


# What is it?

- Reactive
  - Consists of 2 main steps:
    - Find the longest safely traversable distance
    - Follow that line
-

*K*

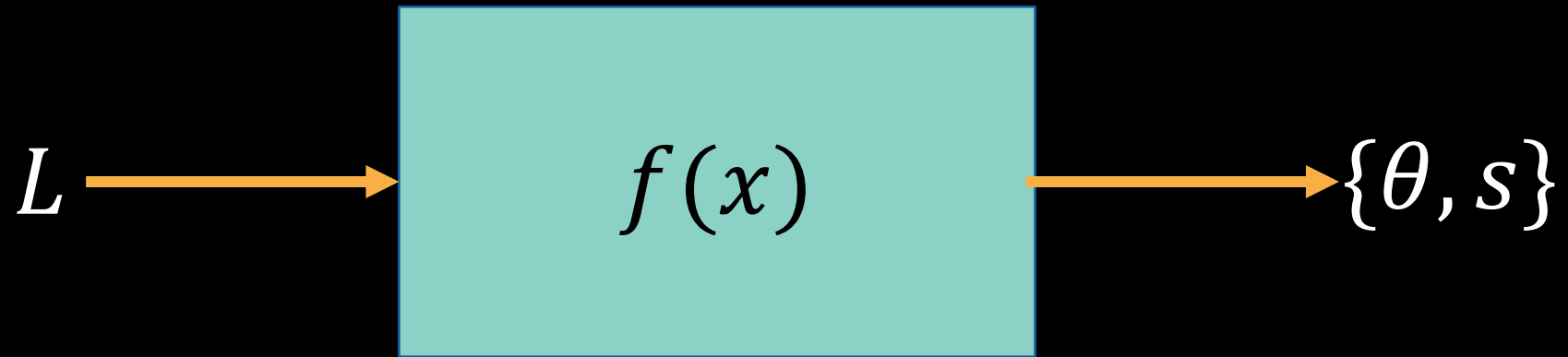
What is it?


$$f(x)$$

---

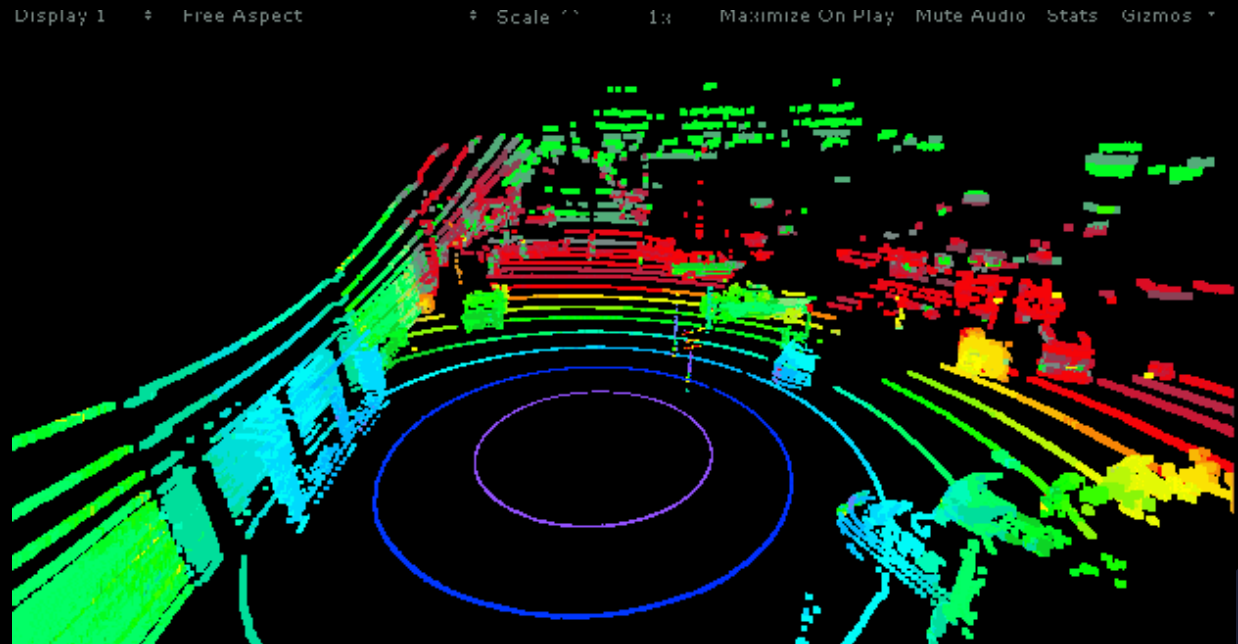
*K*

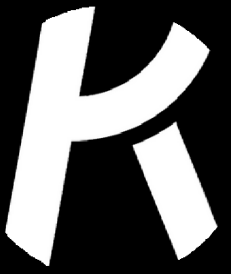
What is it?



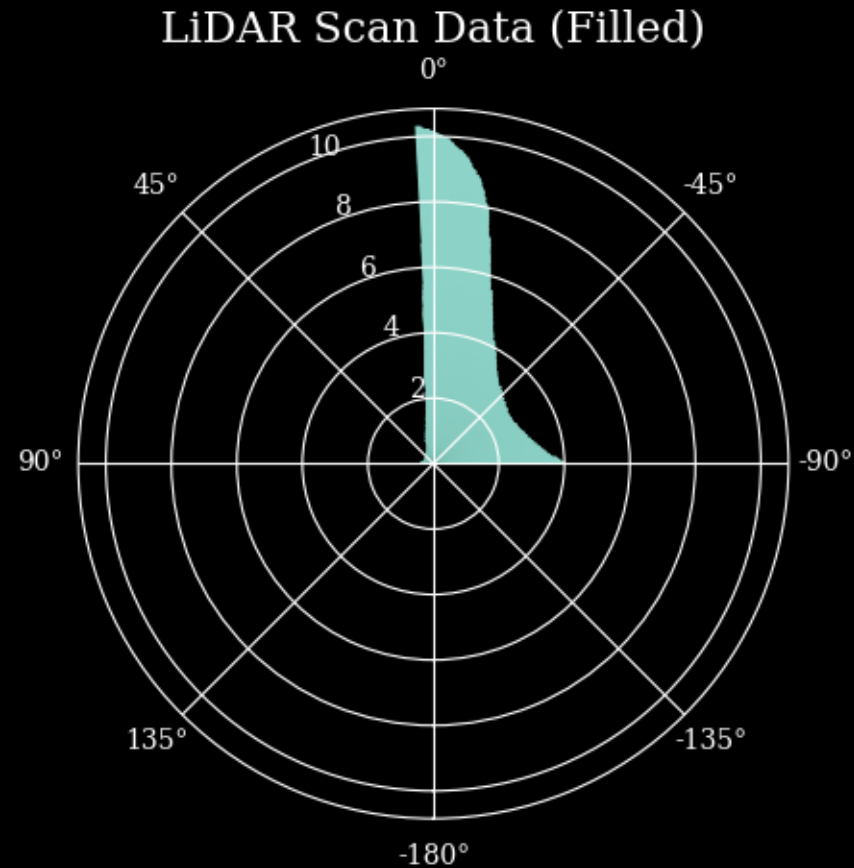
# Longest Safely Traversable Distance

Get the LiDAR scans  
from the sensors





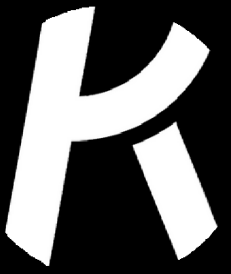
# Get the LiDAR scans from the sensors



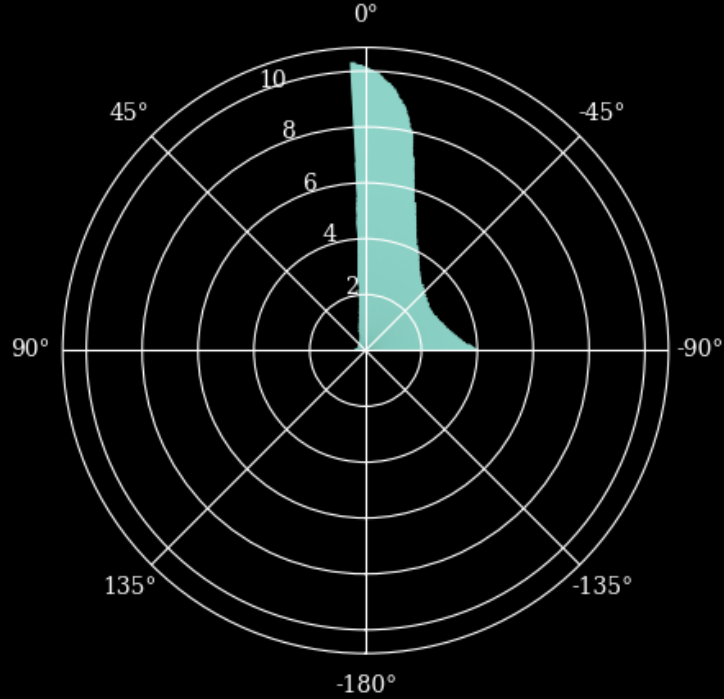
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Longest Safely Traversable Distance

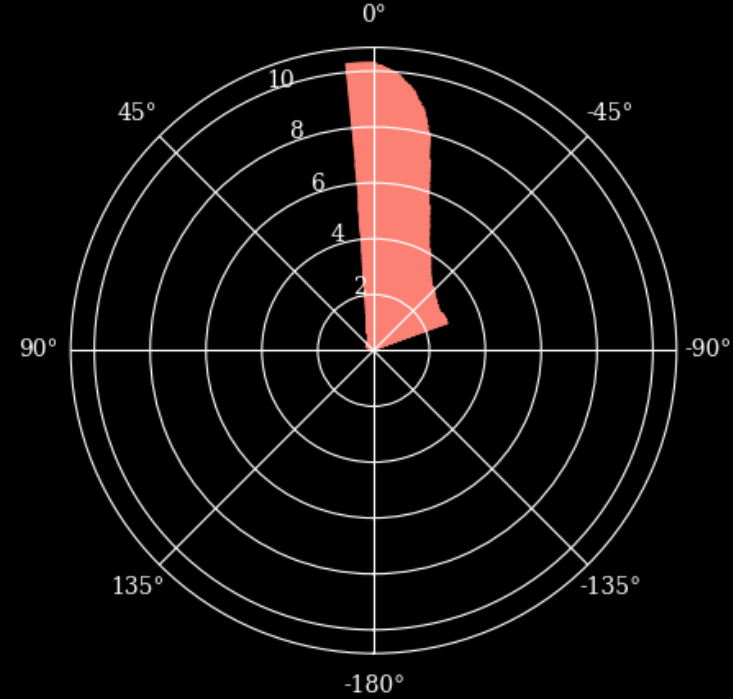
Remove the LiDAR scans from behind  
you and limit your FOV



LiDAR Scan Data (Filled)



LiDAR Scan Data (Pre Processed)



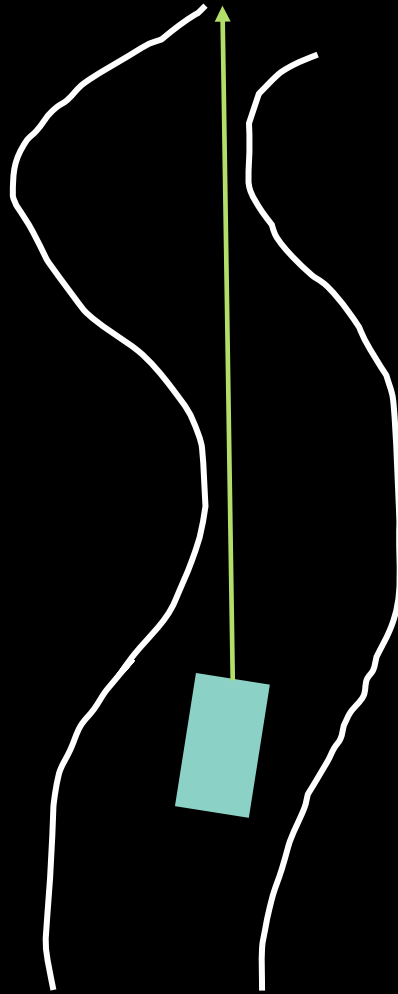
---

Longest Safely Traversable Distance



What happens if we only travel the longest  
distance?

K

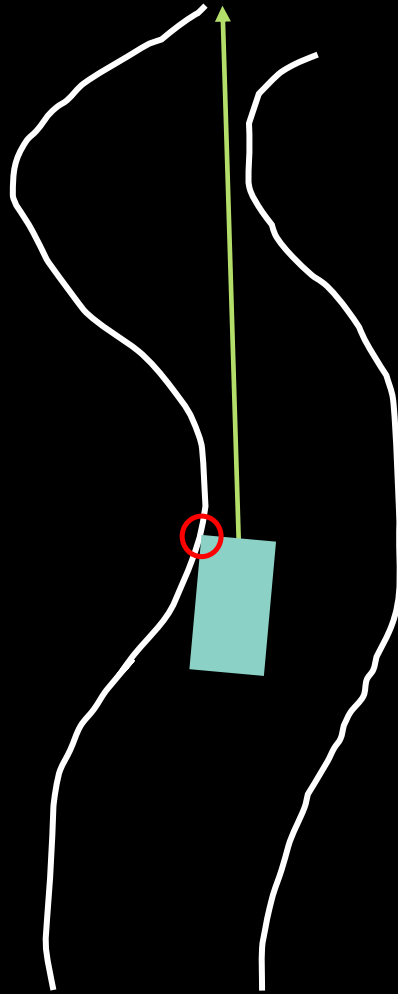


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Longest Safely Traversable Distance

What happens if we only travel the longest  
distance?

K

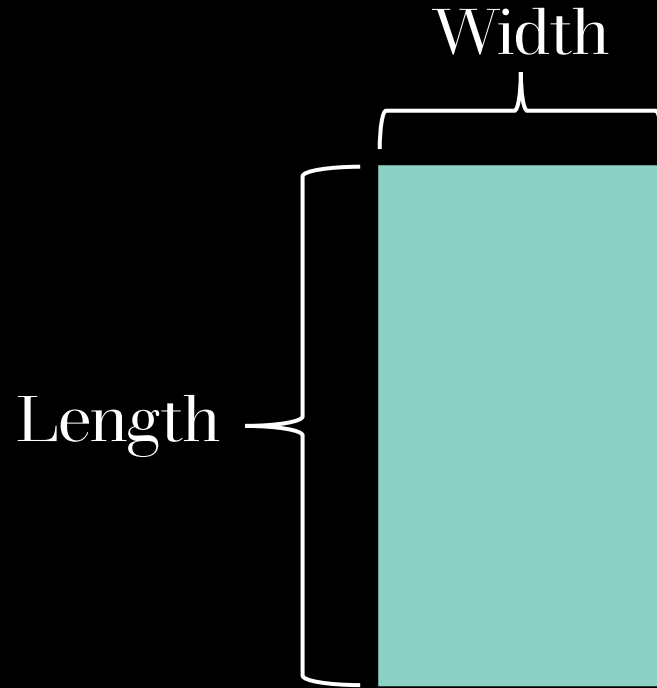


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Longest Safely Traversable Distance

What happens if we only travel the longest  
distance?

*K*



---

Longest Safely Traversable Distance

Judging the safe distance by finding disparities

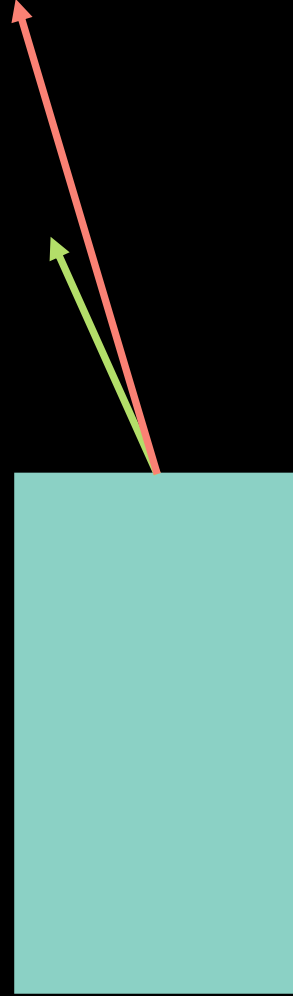
*K*



Longest Safely Traversable Distance

Judging the safe distance by finding disparities

*K*

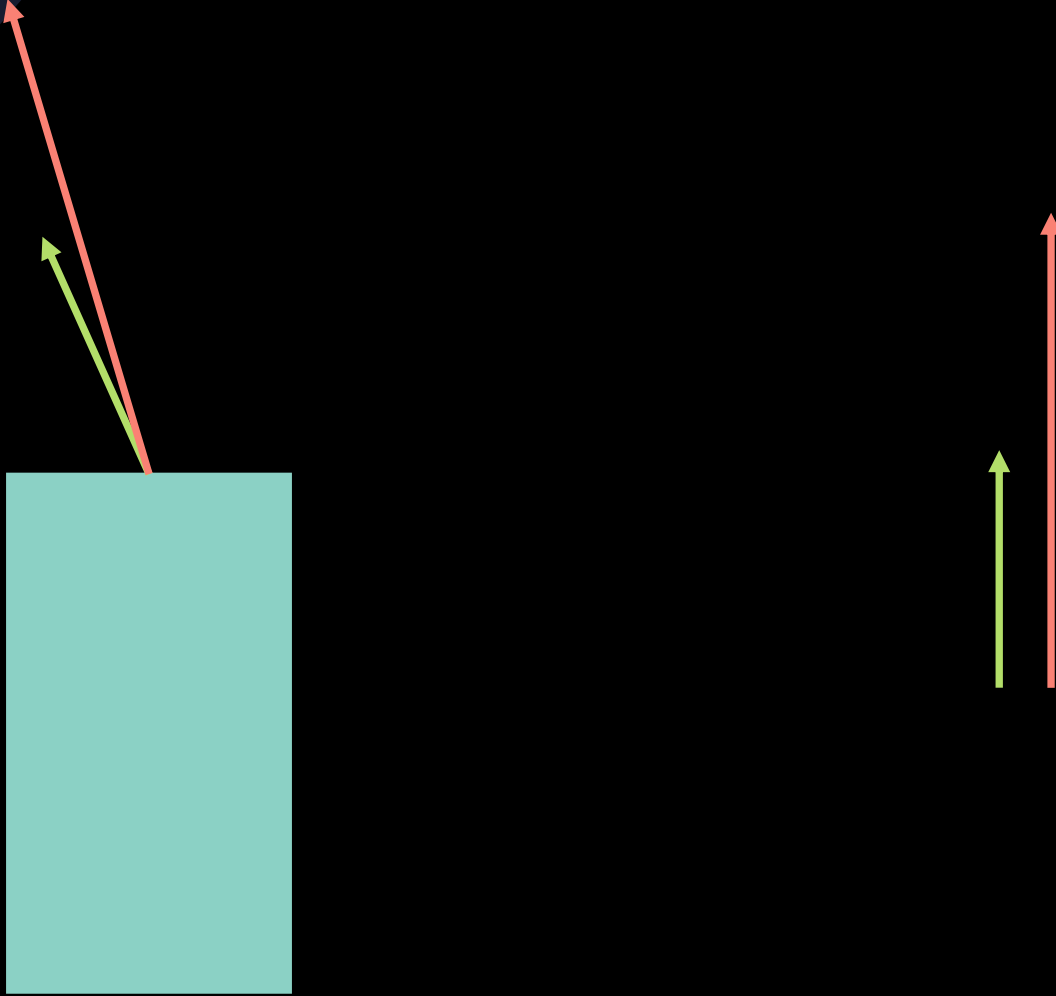


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Longest Safely Traversable Distance

Judging the safe distance by finding disparities

*K*

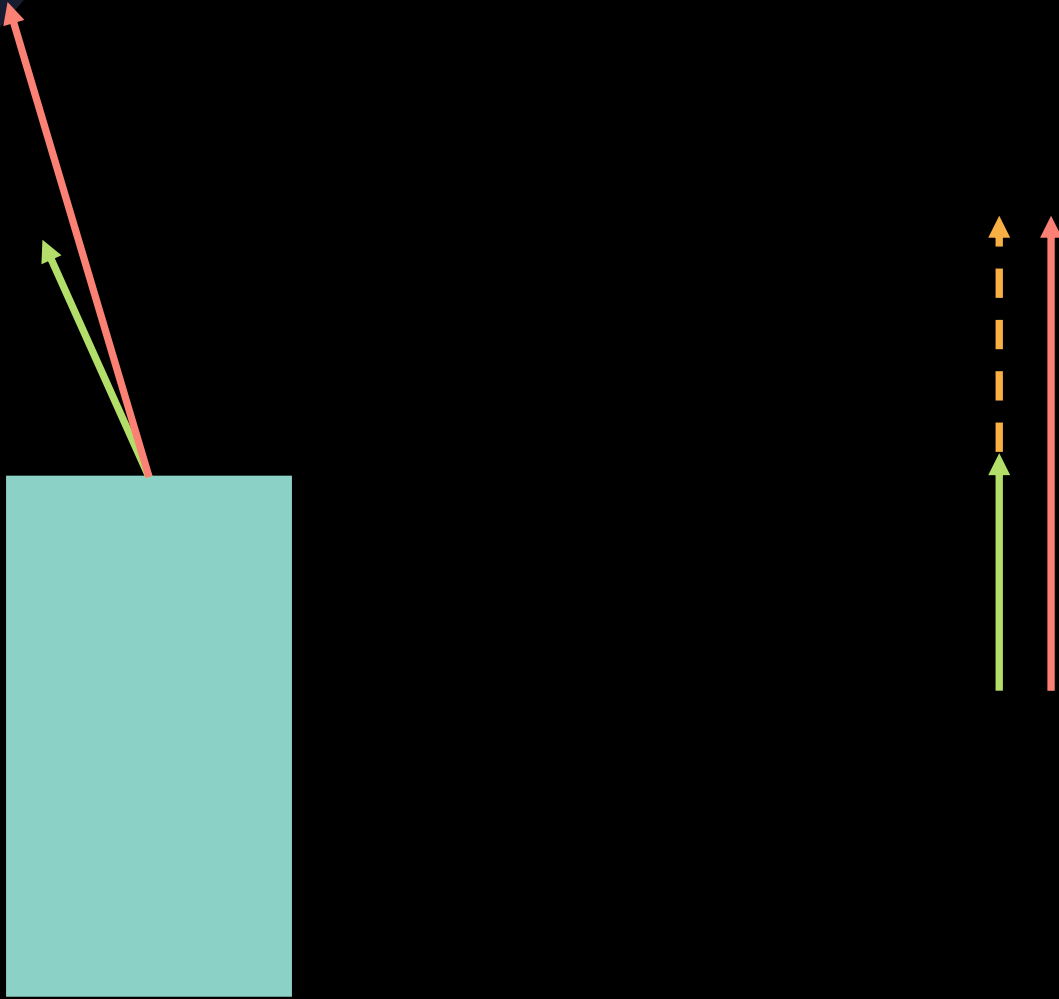


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Longest Safely Traversable Distance

Judging the safe distance by finding disparities

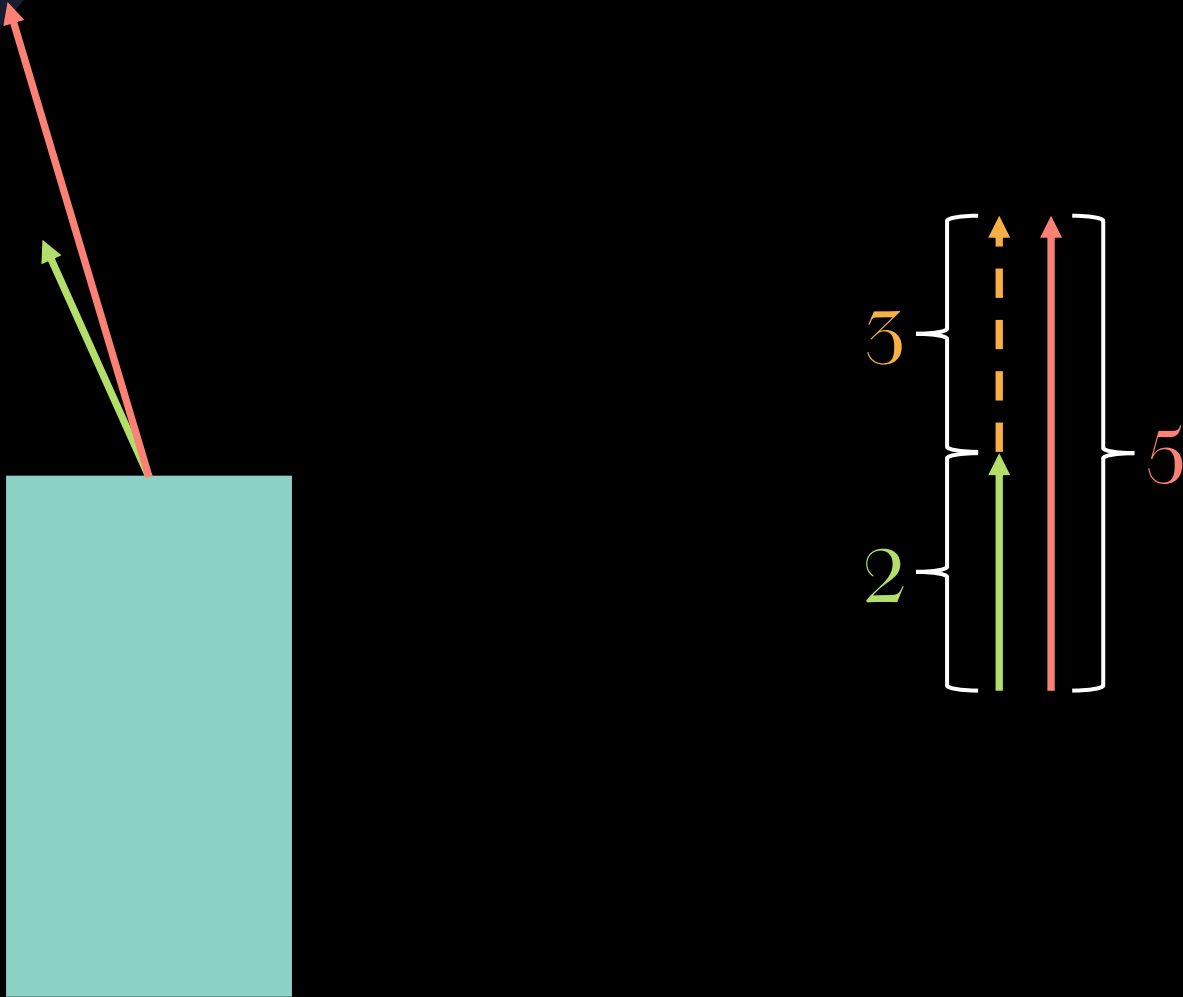
*K*



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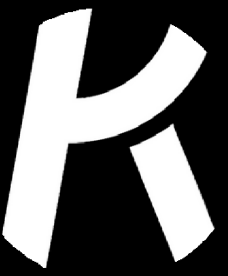
Longest Safely Traversable Distance

Judging the safe distance by finding disparities

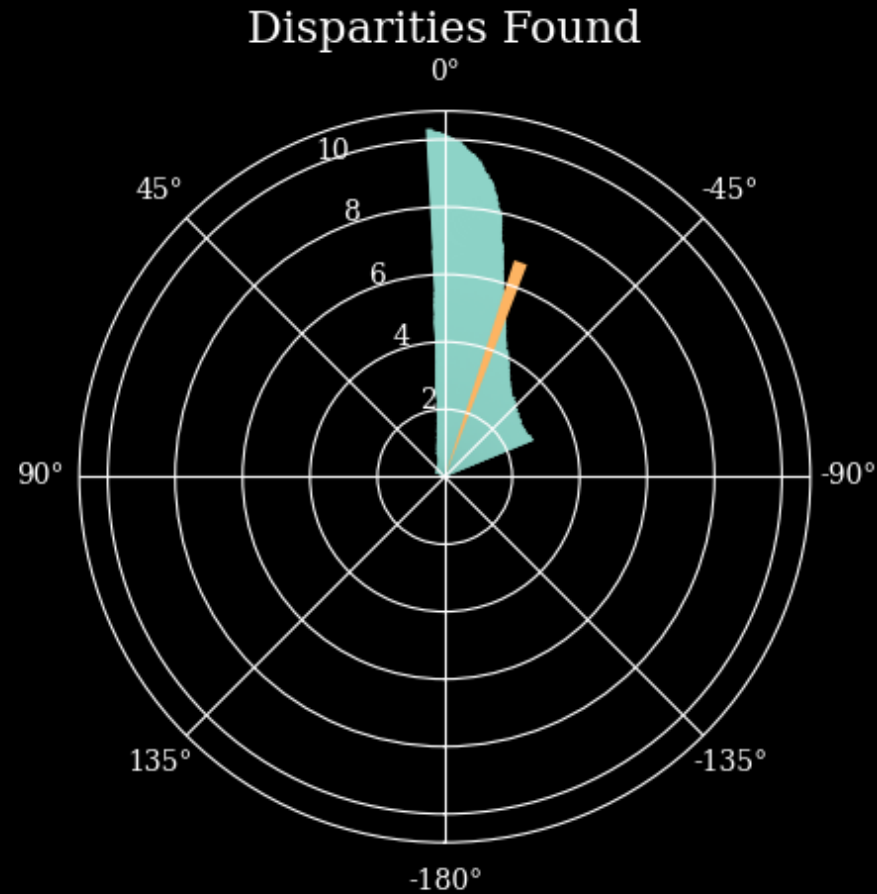


Longest Safely Traversable Distance





# Judging the safe distance by finding disparities

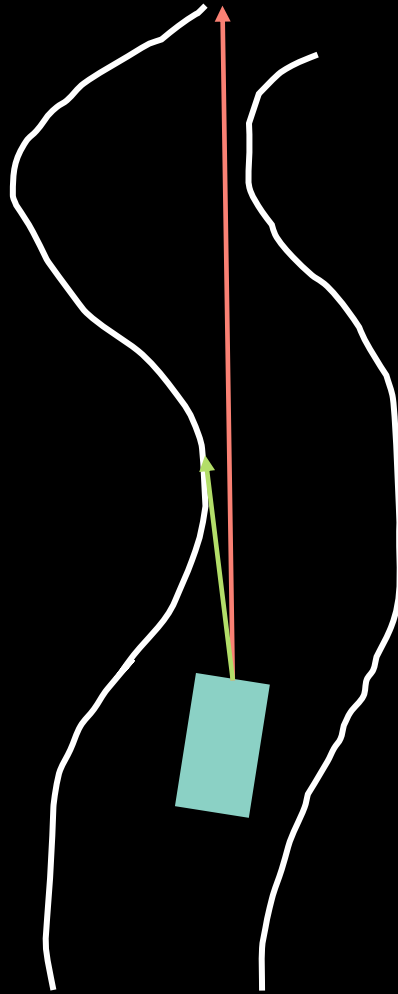


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Longest Safely Traversable Distance

Can we just choose any disparity we find?

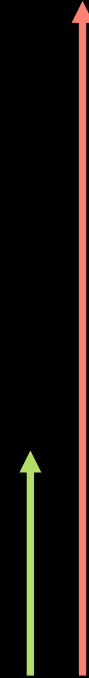
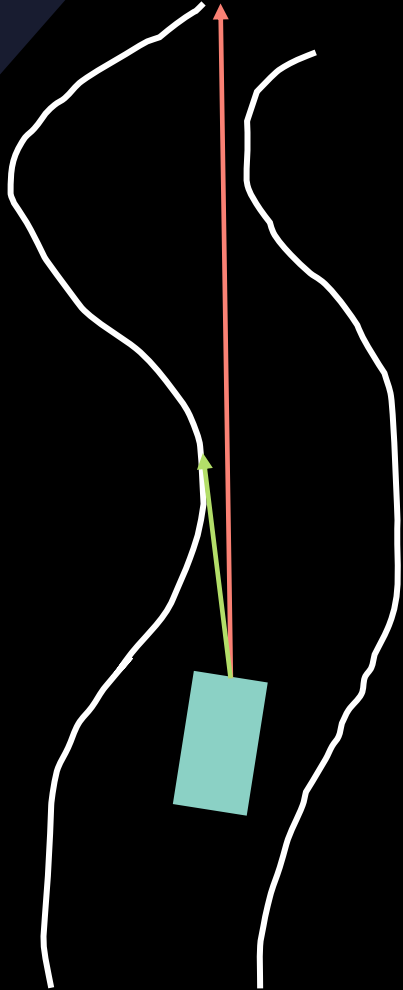
K



Longest Safely Traversable Distance

Can we just choose any disparity we find?

$K$

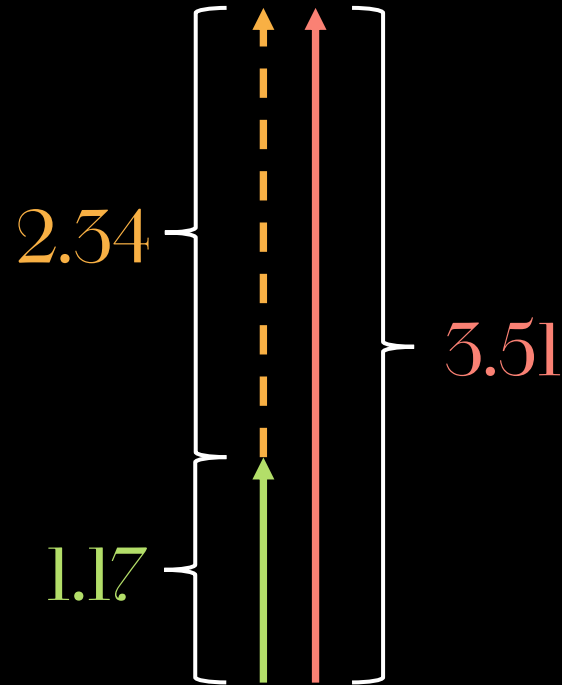
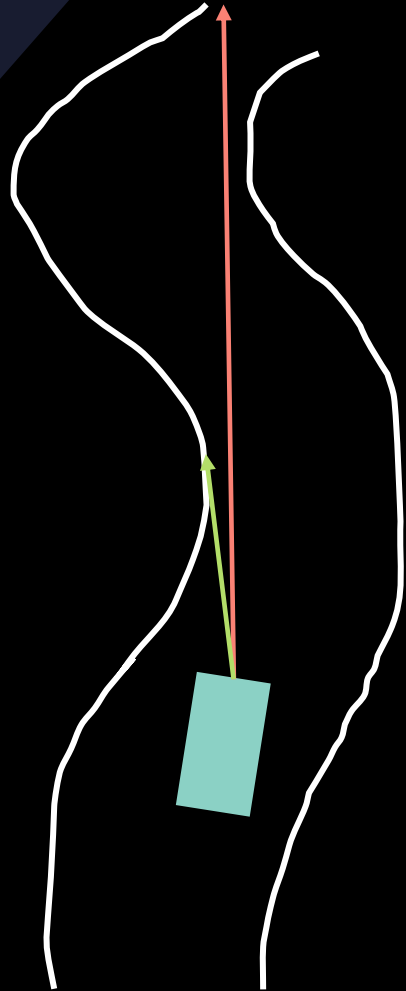


---

Longest Safely Traversable Distance

K

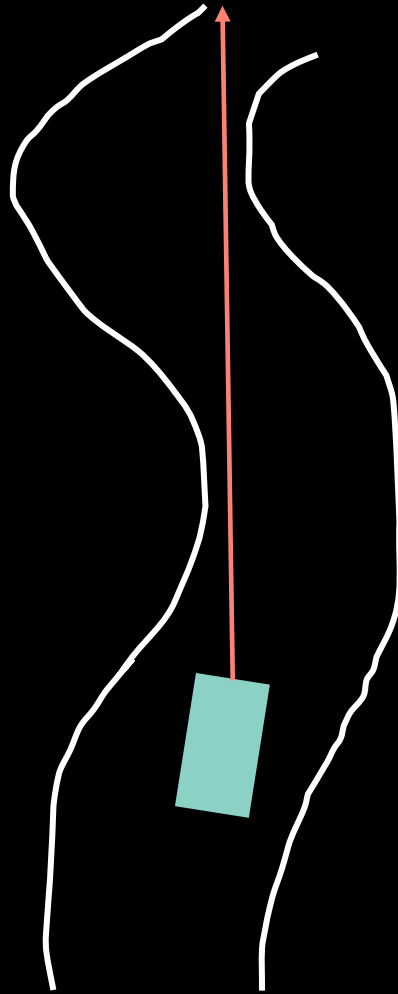
Can we just choose any disparity we find?



Longest Safely Traversable Distance

Can we just choose any disparity we find?

K



---

Longest Safely Traversable Distance

Can we just choose any disparity we find?

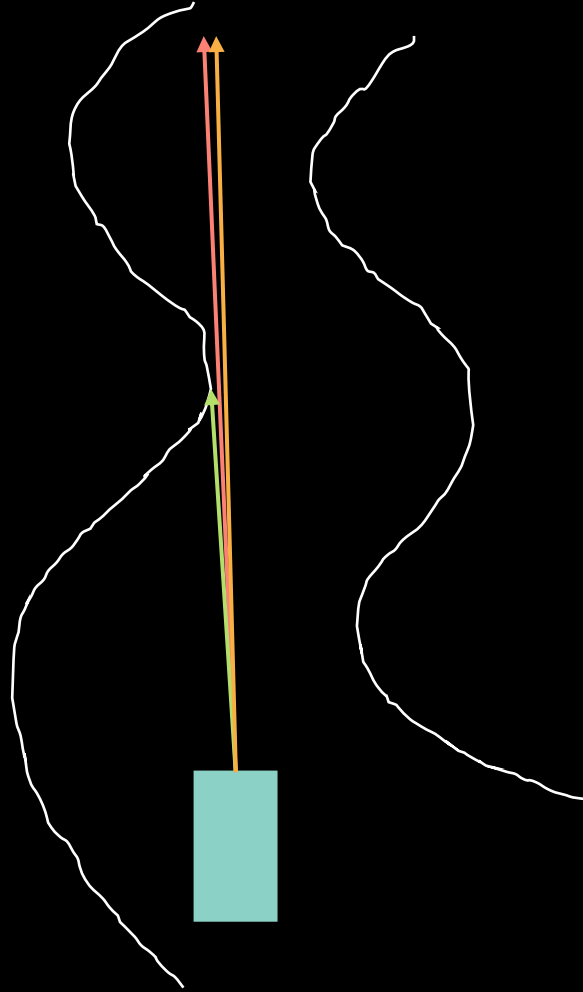
*K*



---

Longest Safely Traversable Distance

Extending the disparity



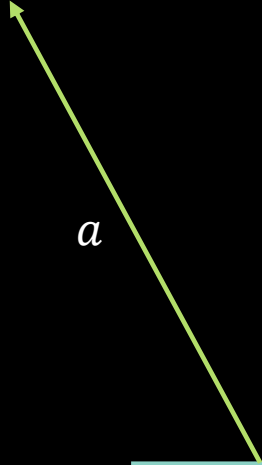
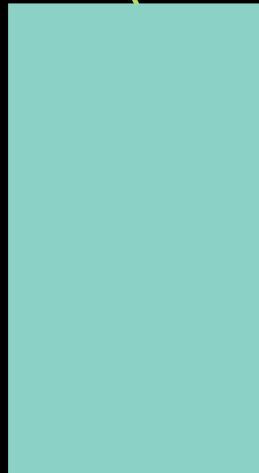
---

Longest Safely Traversable Distance

*K*

Extending the disparity

$a$



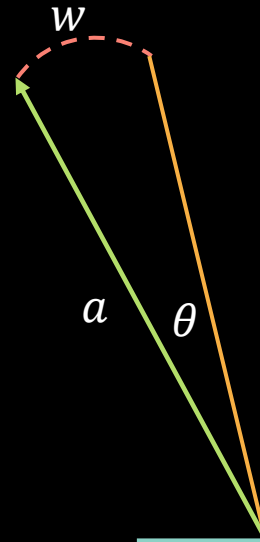
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Longest Safely Traversable Distance



K

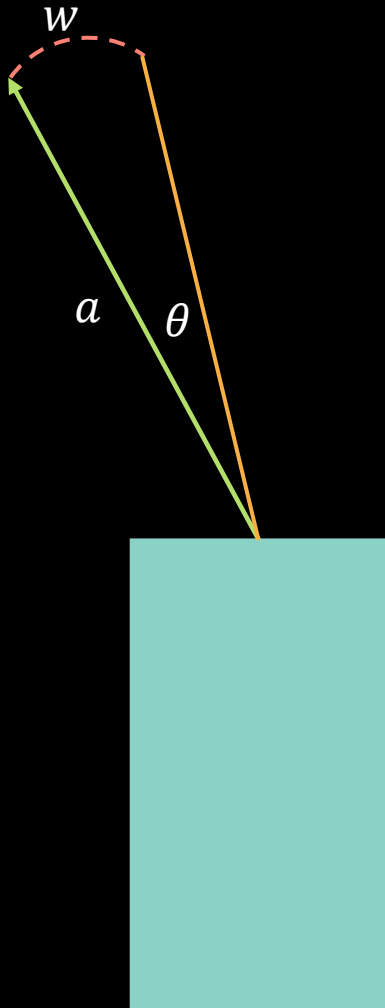
Extending the disparity



---

Longest Safely Traversable Distance

## Extending the disparity



$$w = a\theta$$

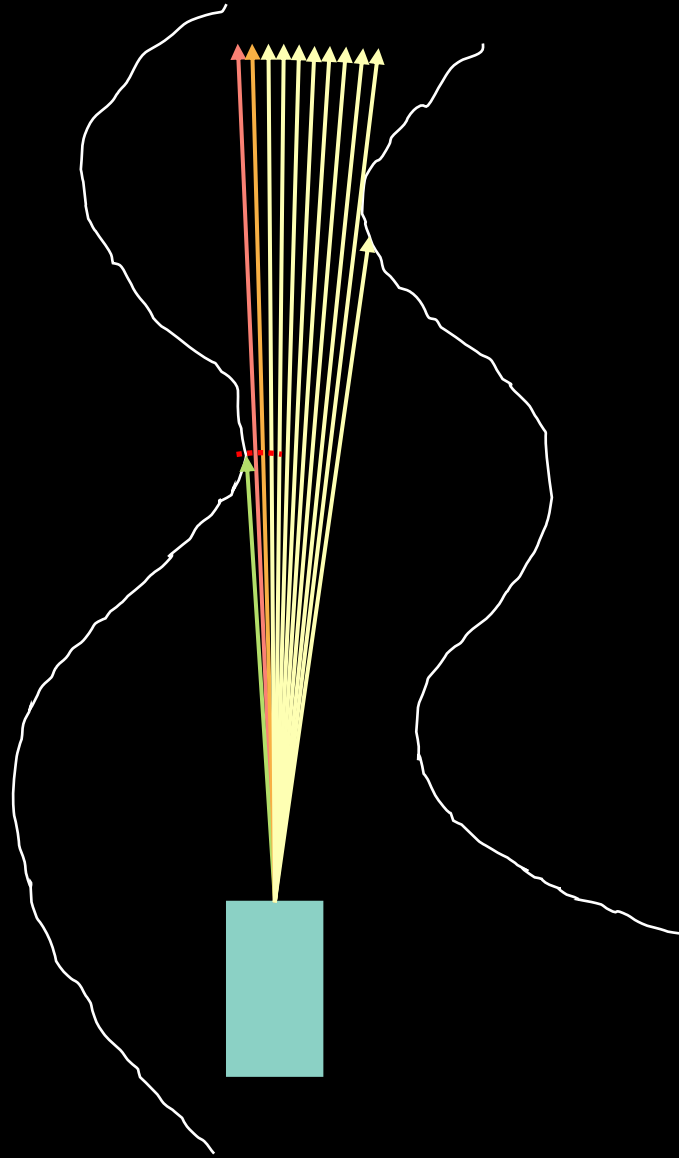
$$\theta = \frac{w}{a}$$

---

Longest Safely Traversable Distance

Extending the disparity

K

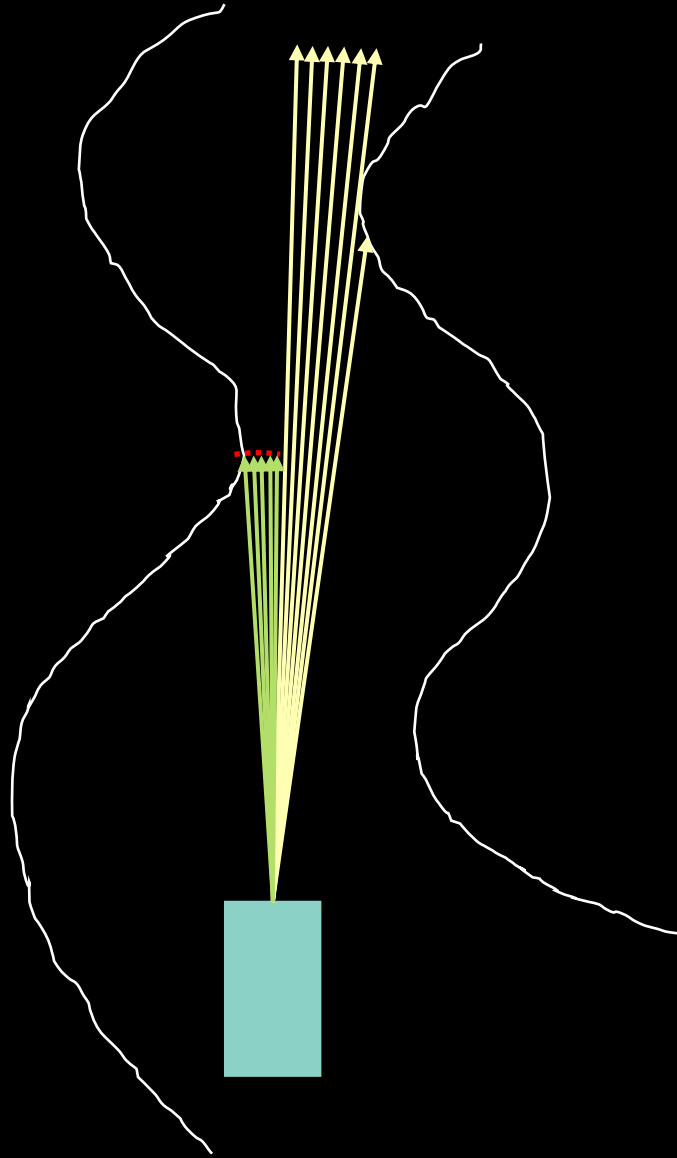


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Longest Safely Traversable Distance

Extending the disparity

K

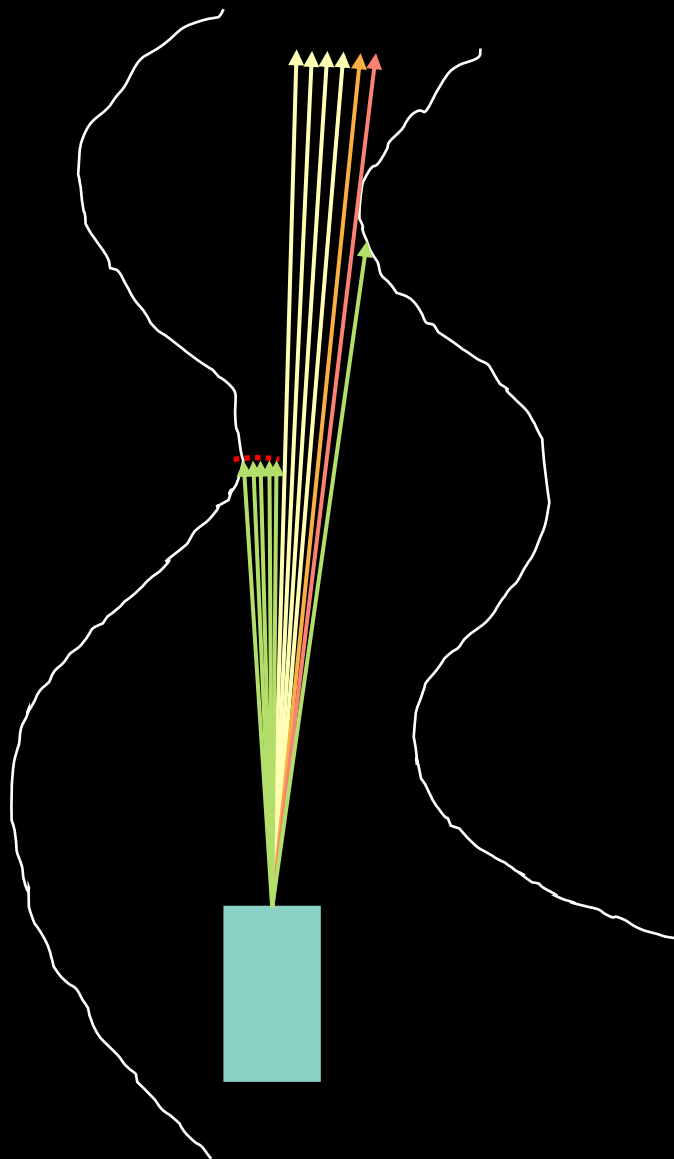


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Longest Safely Traversable Distance

Extending the disparity

$K$

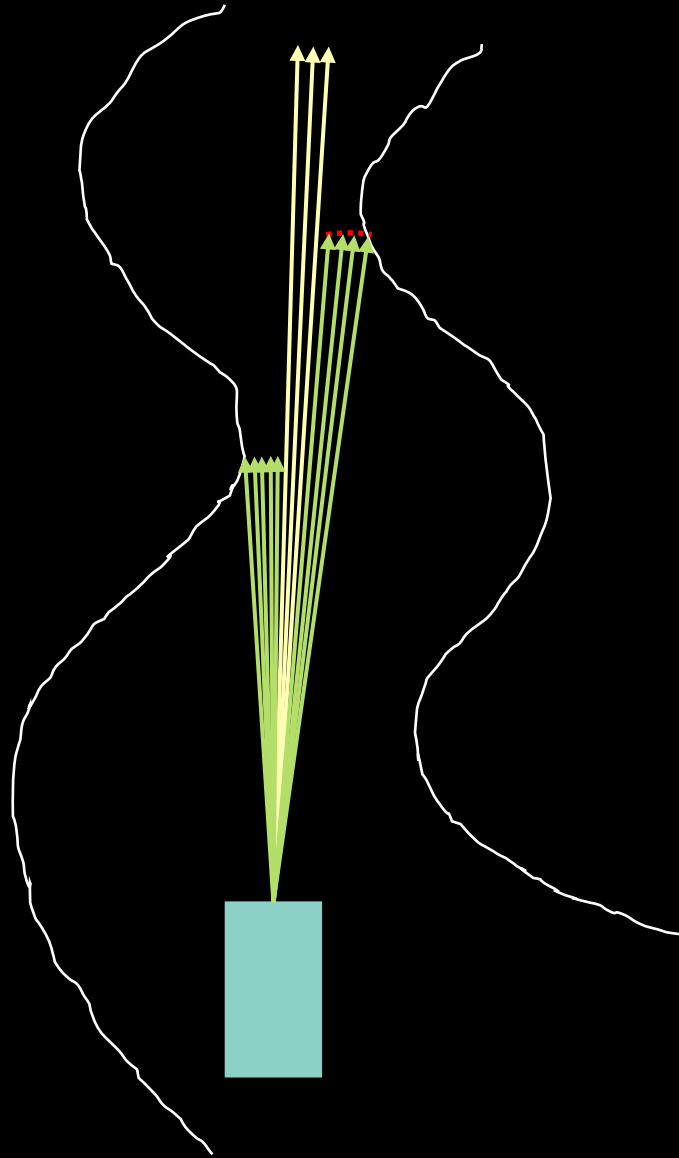


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Longest Safely Traversable Distance

Extending the disparity

K

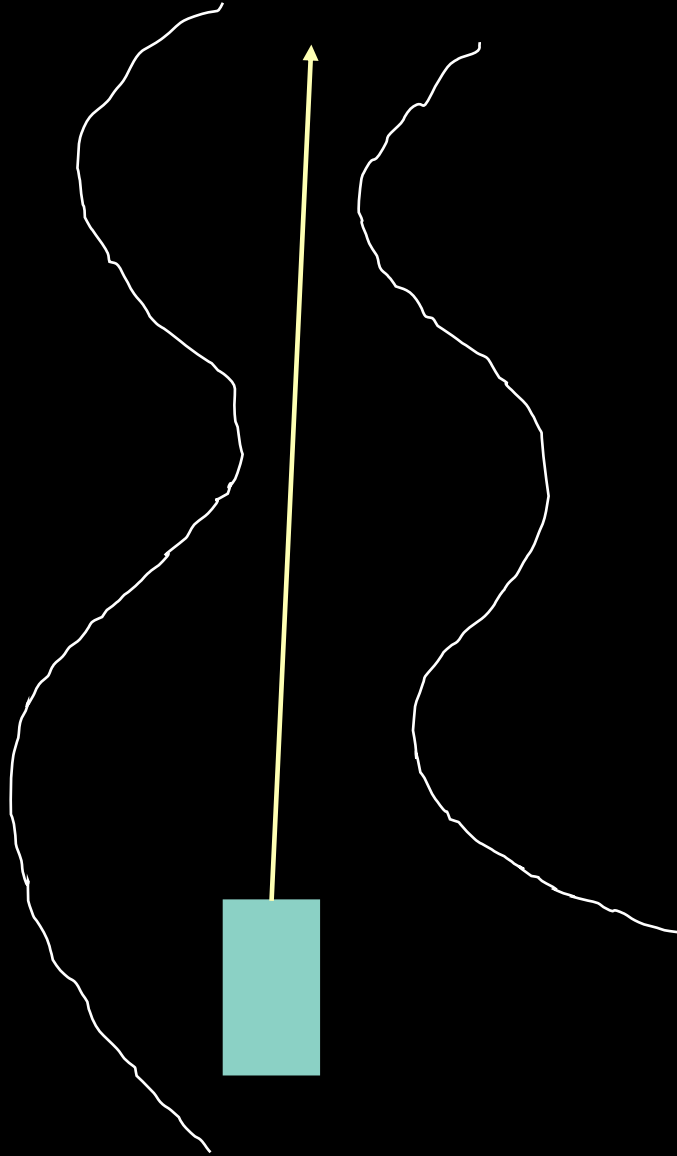


---

Longest Safely Traversable Distance

Now what?

*K*

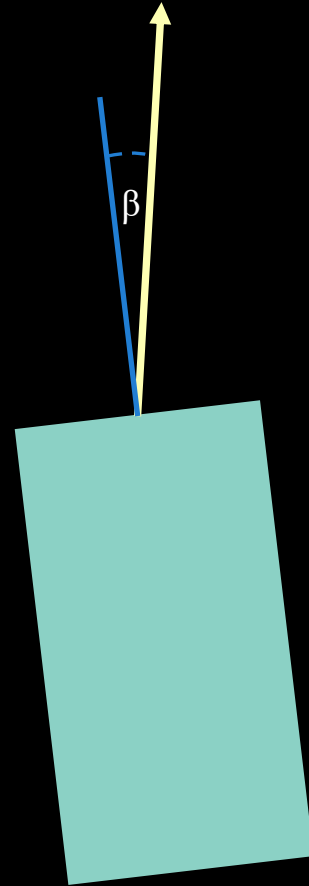


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Longest Safely Traversable Distance

Now what?

*K*

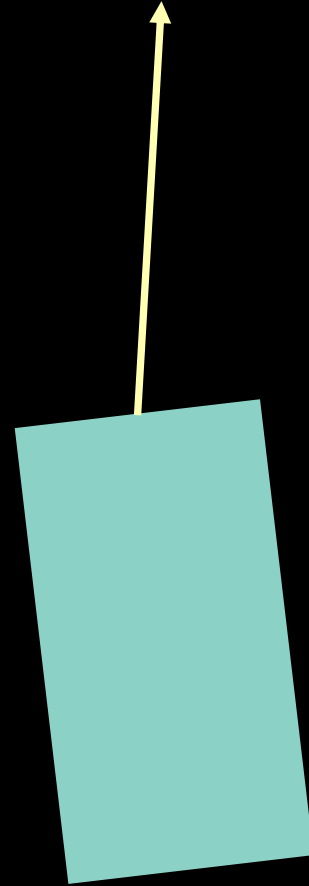


Longest Safely Traversable Distance



Then drive!!

*K*



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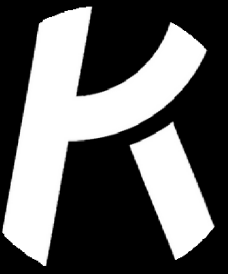
Longest Safely Traversable Distance



What about speed?

---

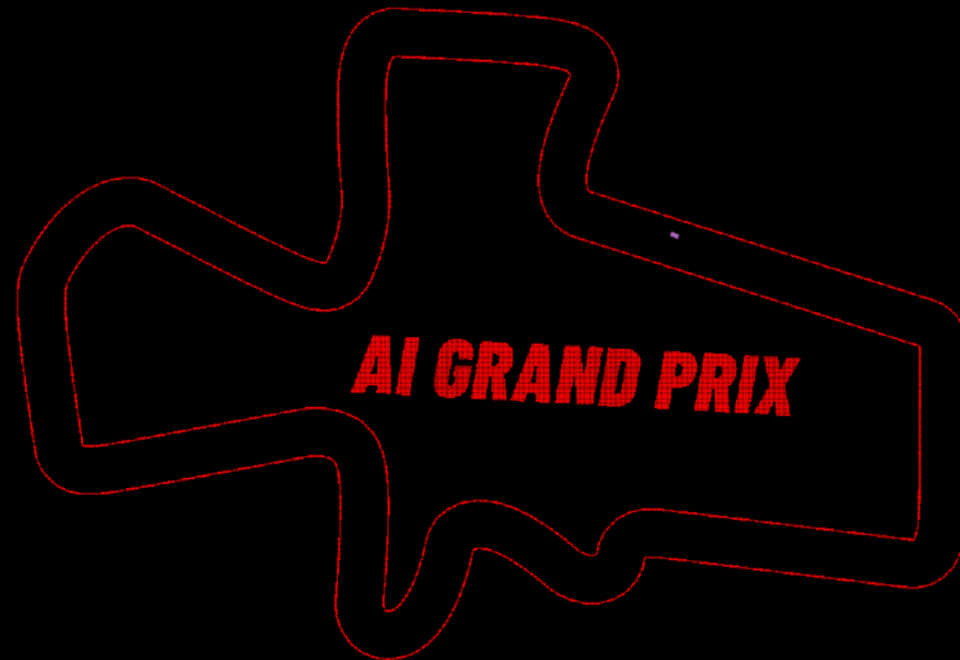
Longest Safely Traversable Distance



# Where to go from here?

Virtual Competition  
- November 2022

Physical Competition  
- March 2023



Lap Time: 6.25, Ego Lap Count: 0

K

# Thank You

Follow us on our Instagram

@racing.ai

Contact us with any questions

racingai.contact@gmail.com

