



# **Sole wear identification**

## **App**

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# Situation & Complication

S: Shoes are a necessity for us every day, and the traces of wear on the soles over time have become a key health indicator.



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C: However, 90% of people don't know **sole wear** related to **position and bad habits** during exercise

# Key Question

KQ: our goal is to **find out the different sole wear** that everyone is unaware of when walking and exercising, and then provide them with a comprehensive improvement methods



01



02

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# Meet the Team

Our group was made up of cross-domain background students, passionating with creating innovative ideas and technologies to help people solve halth problems

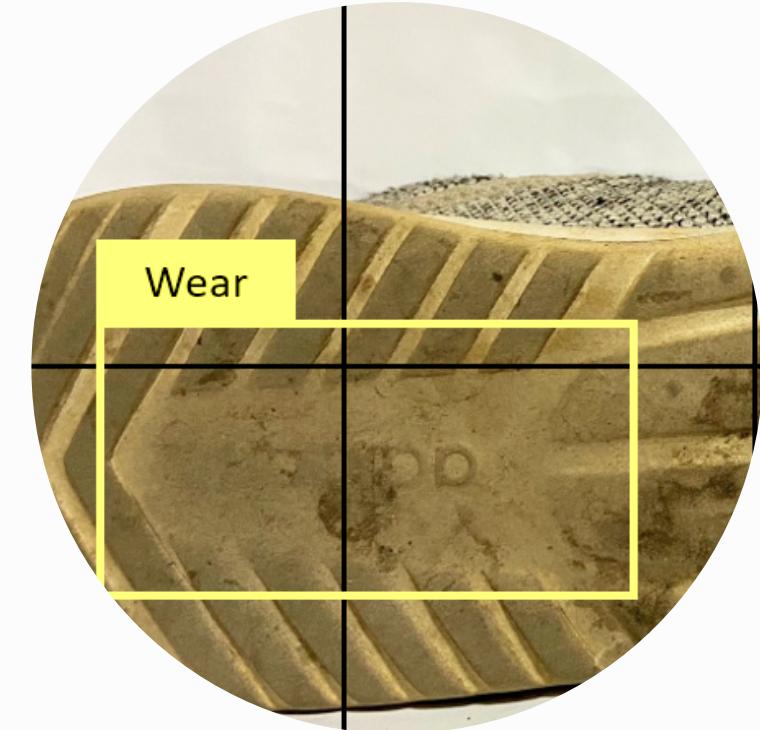
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# Project Introduction

Our goal is to use image recognition models to classify different sole wear patterns. Before training models, we did a lot of data preprocessing such as collecting data, creating database, and labeling.



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## Workflow

**Collect training data**

**Create database**

**Labeling**

**Training**





# Workflow

**Collect training data**

Sportsfield, playground



## Questionnaire

Gender	Age	Exercise Frequency
Usage time	Size	Weight

**Create database**

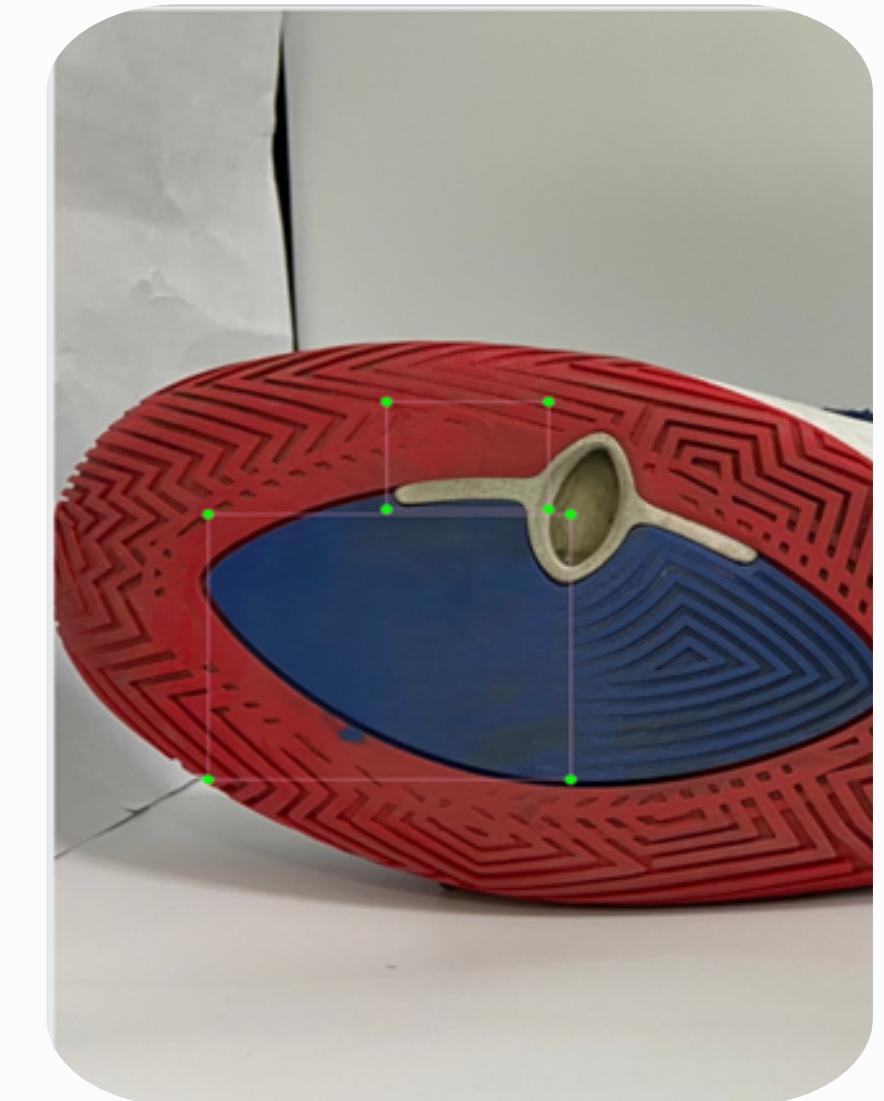
Exercise frequency, weight

**Labeling**

Label areas of wear

**Training**

Train the CNN model



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Normal



Inner Wear



Outer Wear



Front Wear



Insufficient  
wear



Heel Wear



Excessive  
Wear



# 7 Categories

We classified sole wear into 7 categories based on the health and medical report\*, making models to learn the labels.





# Tools introduction

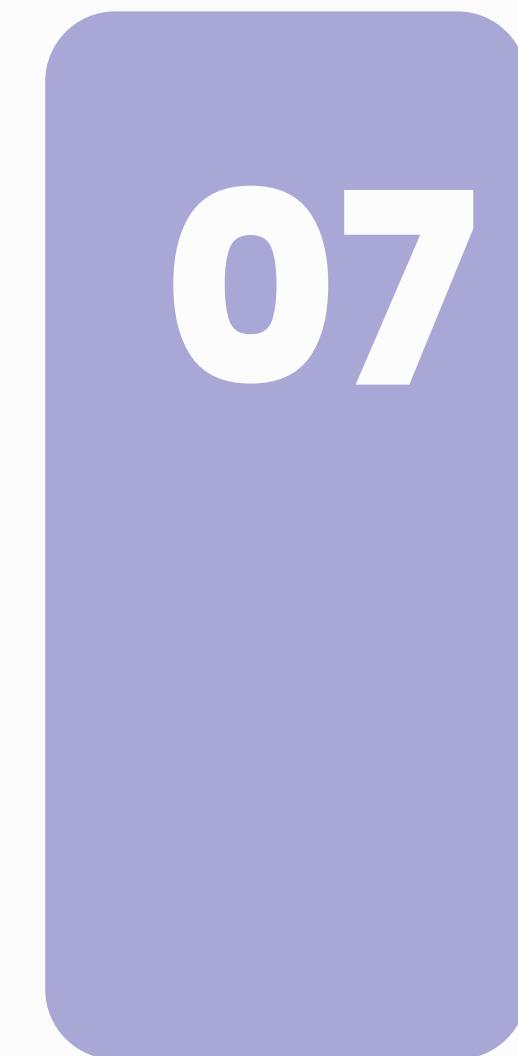
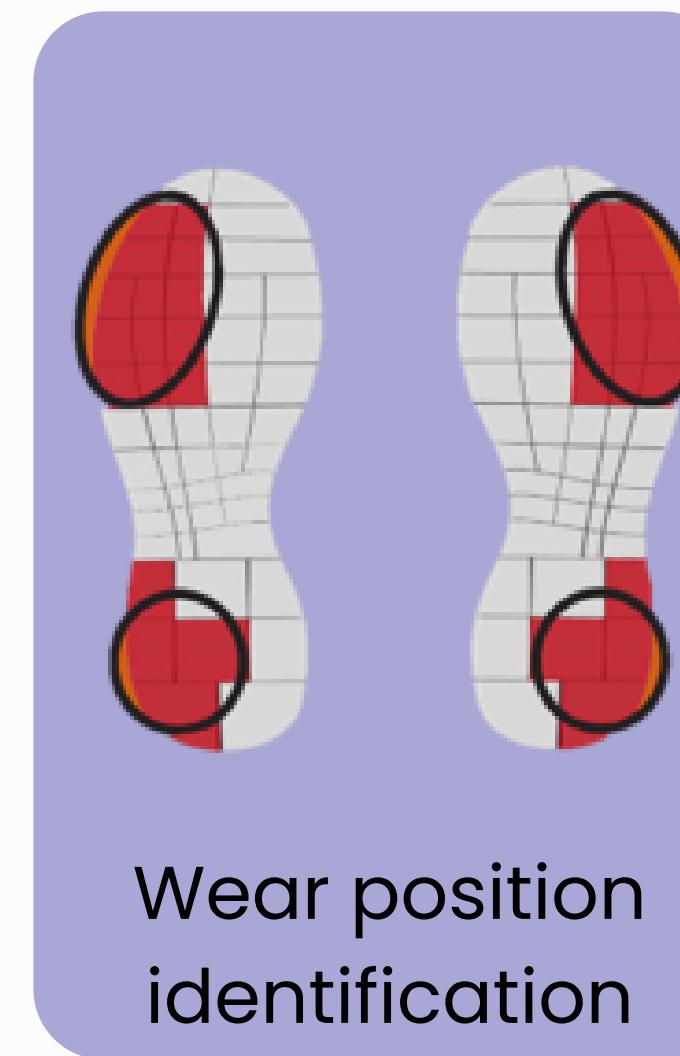
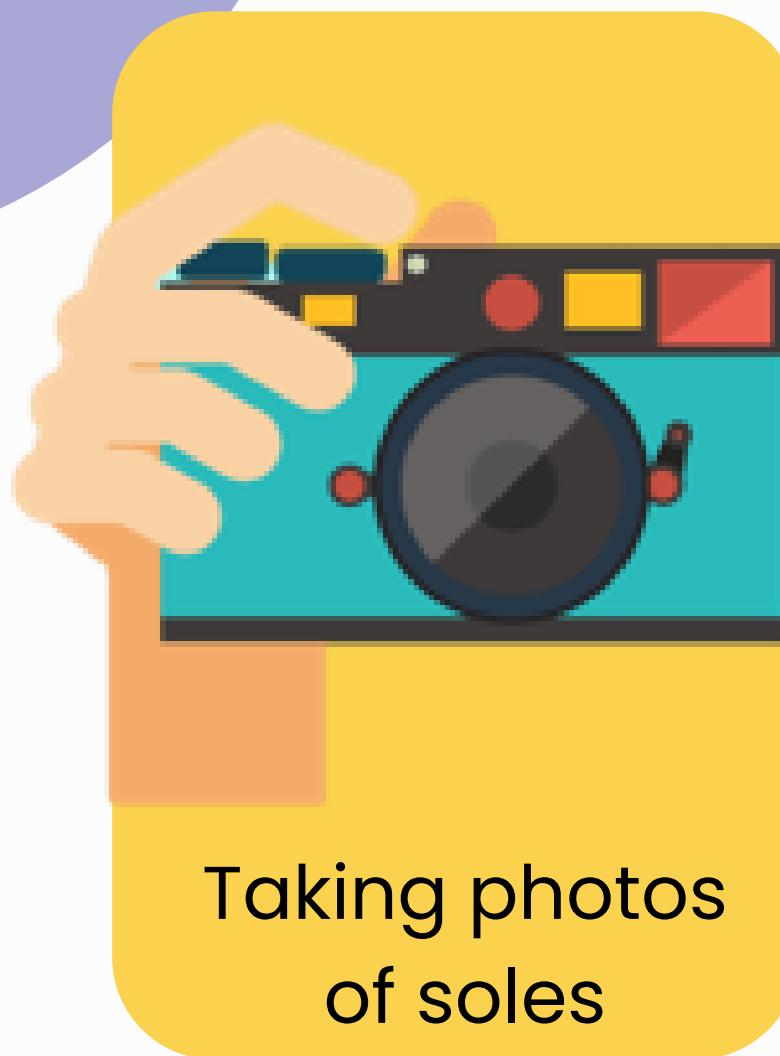
## yolov4

- An object detection system in real-time completely based on CNN
- Isolates a particular image into regions and envisioned the confined-edge box and probabilities of every region
- More precise and superior speed
- Optimize neural networks detector for parallel computations



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# Users workflow

## **Effortlessly Obtain a Comprehensive Health Report for Your Shoes**

With our app, all you have to do is take a photo of your shoes, and our technology will generate a comprehensive health report containing professional recommendations.





# Business Value

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01.



## Customized shoes

Abnormalities that require adjustment, go to a professional institution for free consultation and testing, if customized shoe matching successful, we could get the **referral fee**

02.



## Shoe identification

Extend this App to "**Shoe upper**" identification for people looking for a specific shoe style, taking advantage of what people are searching for to **decide the direction of shoe styles for next season**

03.



## Sole Database

Through continuously collecting a large number of photos of shoe soles, we can **work with police** to provide a **comparison database**





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# App Demo



**Easy to Use**



**Reliable**



**Comprehensive health report**



**Professional suggestions**



# Thank You



**Any concerns or discussions please sent email to: liu02637@umn.edu**