Bike Sentry
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How It’s Used
1. Lock your bike at a bike rack.
   Just like normal, your daily routine is minimally changed.

2. Scan QR code, sign up for texts.
   Instantly become a member of a network of bike owners watching out for one another.

3. Let Bike Sentry guard your bike.
   Bike Sentry is always listening for a thief’s power tools, ready to respond.

4. Listen for phone notifications!
   If we detect a thief while you’re away, Bike Sentry will inform you immediately via text message.

How It Guards Bikes

The Problem:
Modern bike thieves utilize power tools to cut locks in seconds. However, their distinct sound can be leveraged to determine when your bike is in danger.

If a thief dares to use a power tool near Bike Sentry...
• Bouncy Balls are shot at thieves
• Notifications are sent out to a network of users and authorities.

Listening
• We trained an audio classification machine learning model to differentiate an angle grinder from ambient noise
• This model is applied to a constant stream of audio recordings from the device, waiting for an angle grinder to be heard.

Notifying
• Thefts in progress trigger alerts to the tower’s subscribers
• We created an API on Google Cloud Platform to notify a network of bike owners when the tower detects a theft.
Raspberry Pi 4
• Classifies Audio, send text notifications.

Aiming
• Turret motors give feedback to the body recognition model.
Arduino Nano Every
• Direct control of the motors, gets it from Jetson Nano.
Jetson Nano
• Aims the turret and fires.

Deterring
• Turret motors give feedback to the body recognition model.
• Stepper motors for pan and tilt.
• Servo motor feeding balls.
• 2 brushed motors for fly wheels.