

# Problem Statement

**Who cares:** anyone who owns a wirelessly-chargeable phone

**Who has the problem:** People who frequently use wireless chargers for their phones

**What is the problem:** Wireless charging pads are subject to user positioning error, which can negatively affect charging speeds.

**Where is the problem occurring:** Anywhere where a wireless charger is being used. (At home, in car rides, the office, etc.)

**When is the problem occurring:** When the device is not oriented on the charging pad in the optimal position.

**Why this problem is important:** In today's day and age, many people depend on their phone to get important information, communicate with others, navigate to their next destination, and much more. This makes having a fully charged phone each morning and throughout the day vital to many in order to have a productive day. On top of this, having a more efficient wireless charger can allow people to use their phones more efficiently and frequently.

**How will this problem be solved:** Develop a wireless charger that can orient the charging coil (Tx), on a 2D plane, with the internal coil within the device (Rx) using a current sensor.

When you place a phone on a wireless charger, sometimes the phone does not charge optimally/efficiently depending on where the phone is placed on the charger. Our goal is to construct a wireless charger that will charge the user's phone efficiently no matter where it is placed.

# Intended Users and Uses

1. People who use wireless chargers frequently for their devices.
  - a. Key characteristics:
    - i. Can be anyone who owns a phone and wireless charger
  - b. Needs related to the project
    - i. Optimize charging for user devices.
    - ii. Offer a device that does not rely on phone software.
  - c. How they might use or benefit from the product we create:
    - i. In a day and age where our phones are becoming more of a necessity, it is essential that our phones are able to charge efficiently in order to make the most out of them.
2. Families/companies who use different varieties of phones (ex: Apple, Android, Samsung, etc.)
  - a. Key characteristics:
    - i. Can be anyone who owns a phone and lives/works with people who own different types of phones.
  - b. Needs related to the project
    - i. Optimize charging for user devices
    - ii. A “One size fits all” approach. Makes charging phones in one place simpler.
  - c. How they might use or benefit from the product we create:
    - i. It would remove the need for many different charging cables that differ slightly between phones.
3. Mrs. Huang
  - a. Key characteristics:
    - i. Cheng Huang told us that his wife uses wireless chargers often, but often misplaces her phone on the charger, causing the phone to not charge efficiently or at times not at all.
  - b. Needs related to the project
    - i. Improve convenience and efficiency of her wireless charger for her phone.
  - c. How she might use or benefit from the product we create:
    - i. Having a more efficient charger will allow her to be able to use it more often, as everyday our phones are becoming more of a necessity.