

Romberg Web App

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Team 2 - Sophia C, Syed M,
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Code -

<https://github.com/search?q=org%3Aa2approm+author%3Ajdmortson&type=commits>

Artifacts -

/courses/cs410/s26/hdeblois/GR0UP2/longproj01/t2-WR/jmortson-artifacts

Website -

https://a2approm.github.io/Manik_Data_For_Romberg/

Supabase -

<https://supabase.com/dashboard/project/xmxyschvrqcqhgzjdgu>

Task 1 - Data Ingestion

Establish recording protocol, record test trials, modify csv upload area

Task 2 - Frontend UI

Create educational html page, ground truth classifier buttons

Task 3 - Supabase Backend

Configure website backend integration and simple schema

Task 4 - Data Storage & Validation

Setup backend to store user uploaded csv files along with predictions and output

Task 5 - ML Retraining

Build a script to automatically retrain model with stored files

T - Shaped Skills

Initial T-Skills -
/home/jmortson
1691.txt

Frontend
UI/UX

Supabase

Test
Driven
Code

GitHub

Project
Management

Database
Management

Backend
Integration

Romberger *balance*

Dataset Performance Pipeline Predict History Learn 

seconds). The model will compute 6 sway features and predict whether your eyes were **open** (normal balance) or **closed** (impaired balance).

How it works

The Romberg test measures postural sway

- 1. Sway magnitude** – compute magnitude from accelerometer x, y, z axes to capture total body sway.
- 2. Six features** – mean, median, std, skewness, kurtosis, and path length of the sway signal.
- 3. Key insight** – eyes closed increases postural sway because the brain loses visual feedback for balance correction.

Recording tips

For best results

- App:** Sensor Logger (iOS/Android)
- Duration:** ~30 seconds of standing still
- Position:** Hold phone against chest or in pocket
- Export:** Accelerometer CSV with x, y, z columns
- Conditions:** Eyes open (normal) or eyes closed (impaired)

What condition did you record?

Telling us the ground truth helps the model learn over time. Leave as "Don't know" if you're just testing.

Eyes open Eyes closed Don't know / testing



Drop your Sensor Logger CSV here

Accepts CSV with columns: x, y, z – or use Acceleration.x|y|z, or accelerometerAcceleration|Y|Z.

No data? [Load a demo CSV](#) to see the classifier in action.

Romberger *balance*

Dataset Performance Pipeline Predict Learn

ABOUT

What is Romberger?

Romberger is an educational tool that digitizes the Romberg balance test using smartphone accelerometer data. An SVM (linear kernel) model was trained on recordings from 9 subjects in Python (scikit-learn), and its weights are embedded directly in the page. Upload a ~30-second accelerometer CSV and get a prediction – eyes open (normal balance) or eyes closed (impaired balance) – instantly in your browser. Not intended for clinical use.

LEARN

Understanding the Romberg balance test

How phone accelerometers and machine learning assess balance by comparing postural sway with eyes open versus closed.

Why accelerometers?

Modern smartphones contain 3-axis accelerometers sampling at ~100 Hz. When standing still, the body constantly makes micro-adjustments for balance (postural sway), and the accelerometer captures these subtle movements.

[Read more](#)

Feature engineering

Raw acceleration is noisy. We compute 6 statistical features from the sway magnitude of each 30-second recording: mean, median, standard deviation, skewness, kurtosis, and path length.

[Read more](#)

The Romberg test

The Romberg test is a clinical neurological exam where patients stand with eyes open then closed. Increased sway with eyes closed suggests impaired proprioception. Our classifier digitizes this assessment using smartphone sensors.

[Read more](#)

Additional Work

- Finish ML retraining script
 - Any new csv file input into the site are added to the initial training dataset
 - Every week a script grabs the new files and retrains our model
 - Model is updated on GitHub if new version proves to be more accurate than previous version
- User Authentication
 - Build a login and sign up area
 - Users must have a unique account to upload
 - Stores upload history, previous results