SocialBit: Quantifying Social Interaction of Stroke Patients

Dominick Reilly, Video and Image Analysis Lab

SocialBit

Goal: Quantify the social interaction of stroke patients to improve health outcomes

We will collect data from 200+ patients!

SocialBit on patient's wrist

Ground Truthers watching from another room

Why? More Social Interaction = Better Stroke Recovery

- Health outcomes are influenced by social interaction
  - **High interaction** → Better outcomes
  - **Low interaction** → Worse outcomes

- Stroke patients isolate themselves

SocialBit: Smartwatch app for measuring social interactions

Goals

- Measure # of minutes of social interaction using raw audio
- Goal setting, encouragement, etc.

Scope:

- Now: stroke patients
- Later: broader audiences

Must be non-invasive

Must be accurate

Constraints

Must be robust to ambient noise

Must maintain privacy

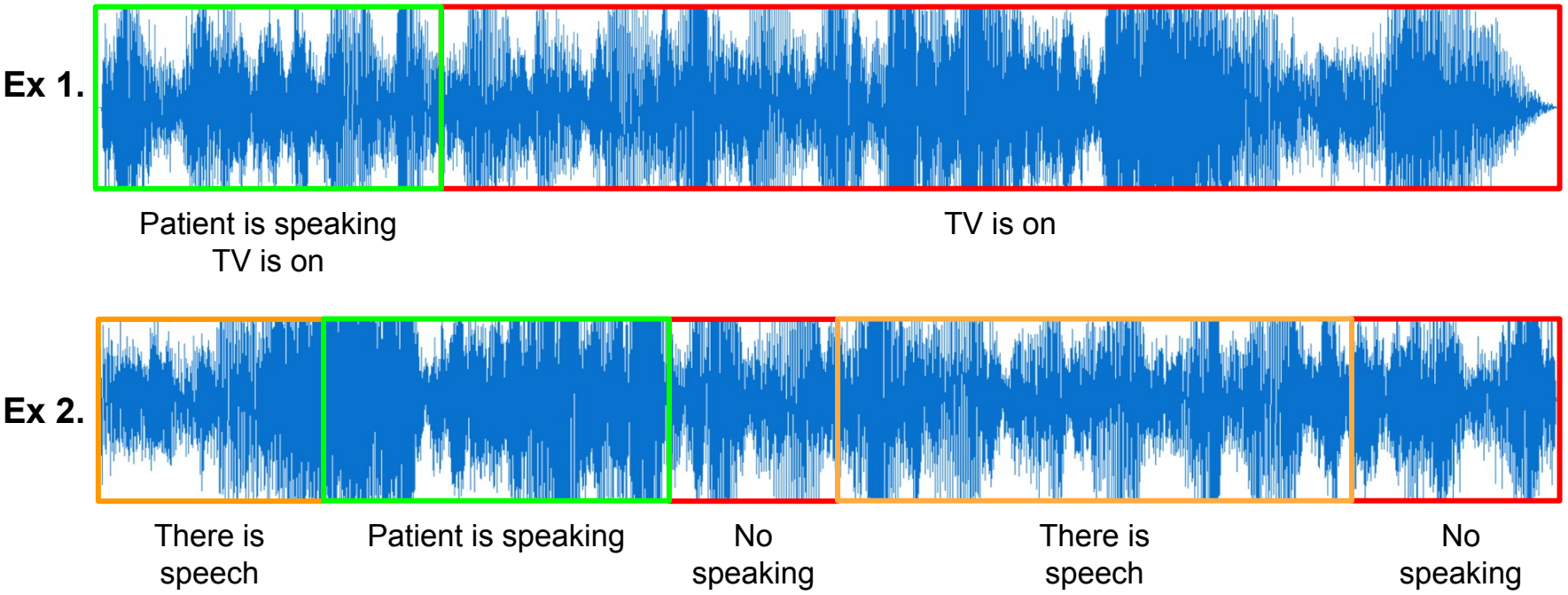
Data collection: 200 patients with “minute-level” labels

SocialBit on patient’s wrist

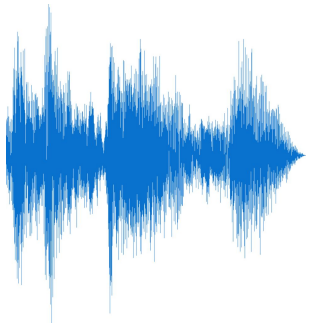
Ground Truthers watching from another room

What we extract from the data

- **Sound events**
- **Speaker profiles**



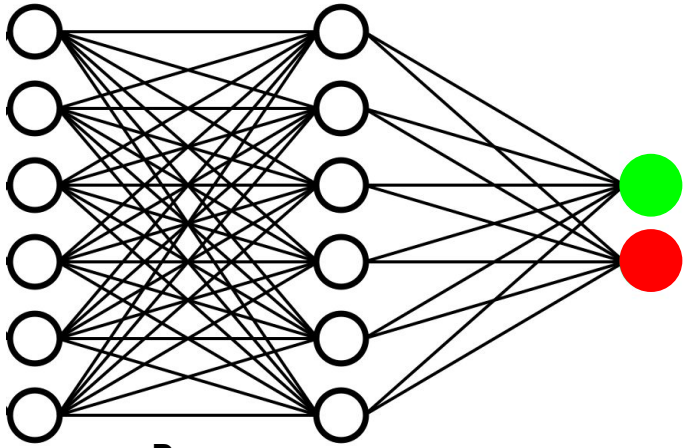
How do we learn from the data?



Audio clip

Extract Features

- **Sound event features**
- **Speaker profiles**



Deep Learning

Interaction

No interaction

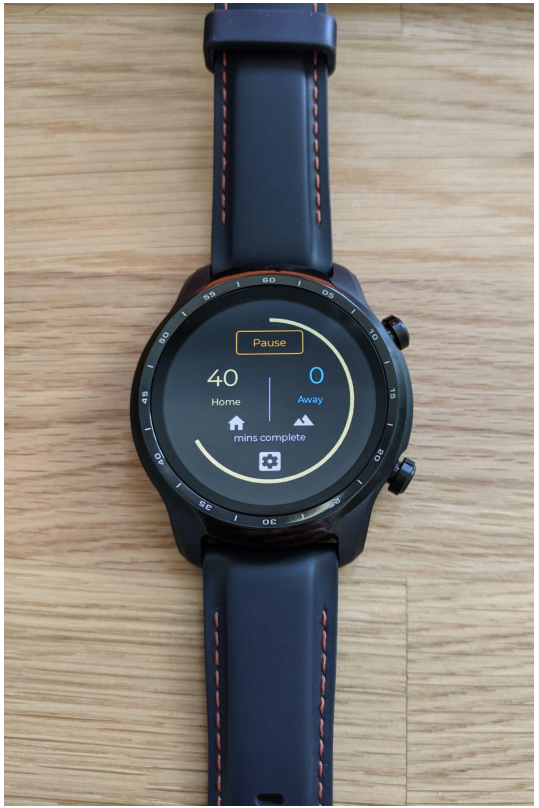
Some difficulties

- Algorithms must be cheap
  - Battery and computation is limited on smartwatch

- Data concerns
  - Stroke victims may not talk much
  - Hospitals can be noisy

A demo


Pause
20
Home
120
Away
mins from goal


Pause
40
Home
0
Away
mins complete

Thank you!

Questions?

Or by email: dreilly1@uncc.edu