Wrkr - Wearable Wrist Activity Tracker and User Exercise Application

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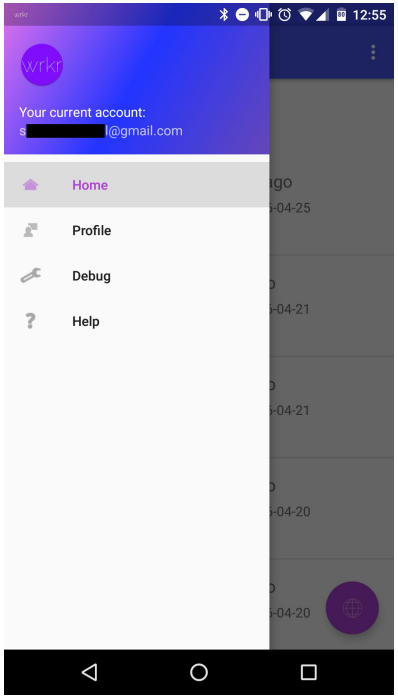
github.com/uml-ubicomp-2016-spring/wrkr

Goal

- Help prevent onset RSIs (repetitive strain injuries) in the wrist
  - De Quervain tendinitis
  - Carpal tunnel syndrome
- Provide wearable monitor to detect when a user is at a keyboard
- Gives users exercises to perform
  - Personal profiles that sync between mobile and web apps
  - Utilizes Leap Motion to detect if user exercising correctly, counts reps
- https://www.youtube.com/watch?v=Dy4j9HQMYvg

Design - Mobile

- Minimal UI
  - User typically only views home screen notifications
- AlarmManager schedule on app start + on boot
  - Runs services automatically, no manual startup
- GoogleApiClient over bluetooth to receive wear data
  - Multiple BroadcastReceivers, Services
  - Retry timers on disconnection

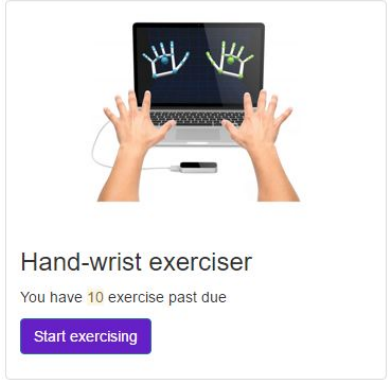


Design - Wearable

- Two notifications: persistent and user alert with vibrate
  - No other user interface - like mobile, is minimal
- Accelerometer data in a service
  - Classified with logistic regression to detect if user at keyboard
- Many tricks to keep service alive
  - Partial Wake Lock
  - Persistent Notification
  - Start service as foreground
  - Return START_STICKY for OS rescheduling
  - Alarm to reschedule service every 10 minutes

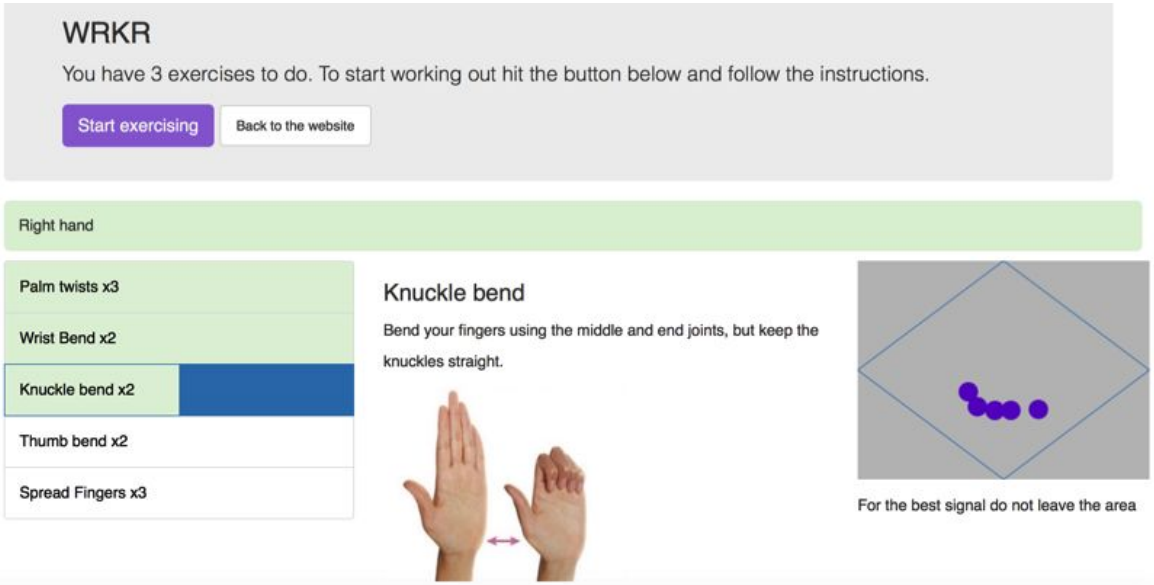
Design - Web

- Link: http://www.cs.uml.edu/~sfomiche/wrkr/
- Google sign in, sign out, session state
- All user's story in one place
- Data exchange with the server behind the scene
  - no page reload



Design - Leap Motion

- Five exercises, both hands, with Leap Motion device
- App works in a browser, frame rate = 60fps



- Can be used in a test mode without profile creation
- Screen adjustable design
- Interactive box
- All major browsers tested

Thank You