

Rehabilitation Driving Simulator

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Description & Features:

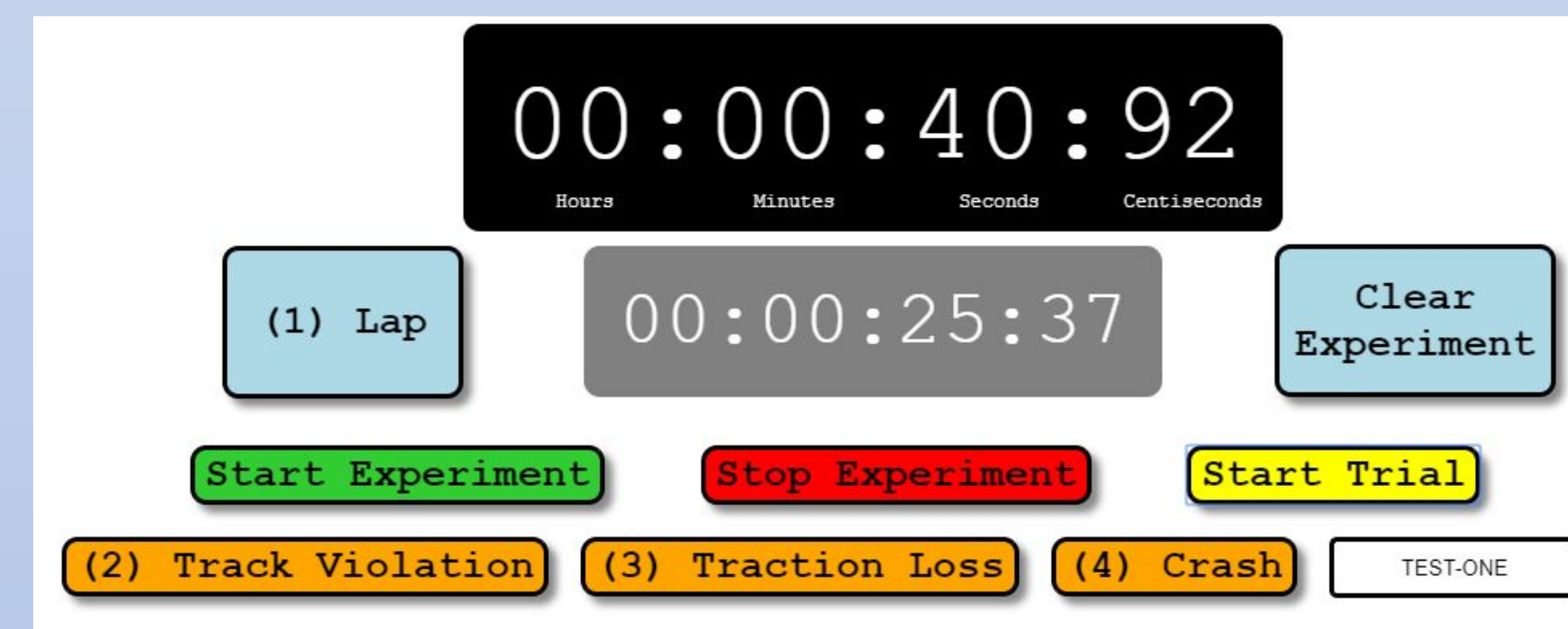
The simulator will help individuals with degraded motor skills learn to drive again and regain confidence on the road by practicing under different training scenarios in realistic simulated environments.

The simulator features a car seat (which provides haptic feedback mimicking real driving), typical driving controls, and an optional head-tracking system.

This interface and the wraparound HD screens provide a life-like experience; the sandbox approach should help the user overcome the anxiety and stress of effectively being a new driver on the road.



The Web App:

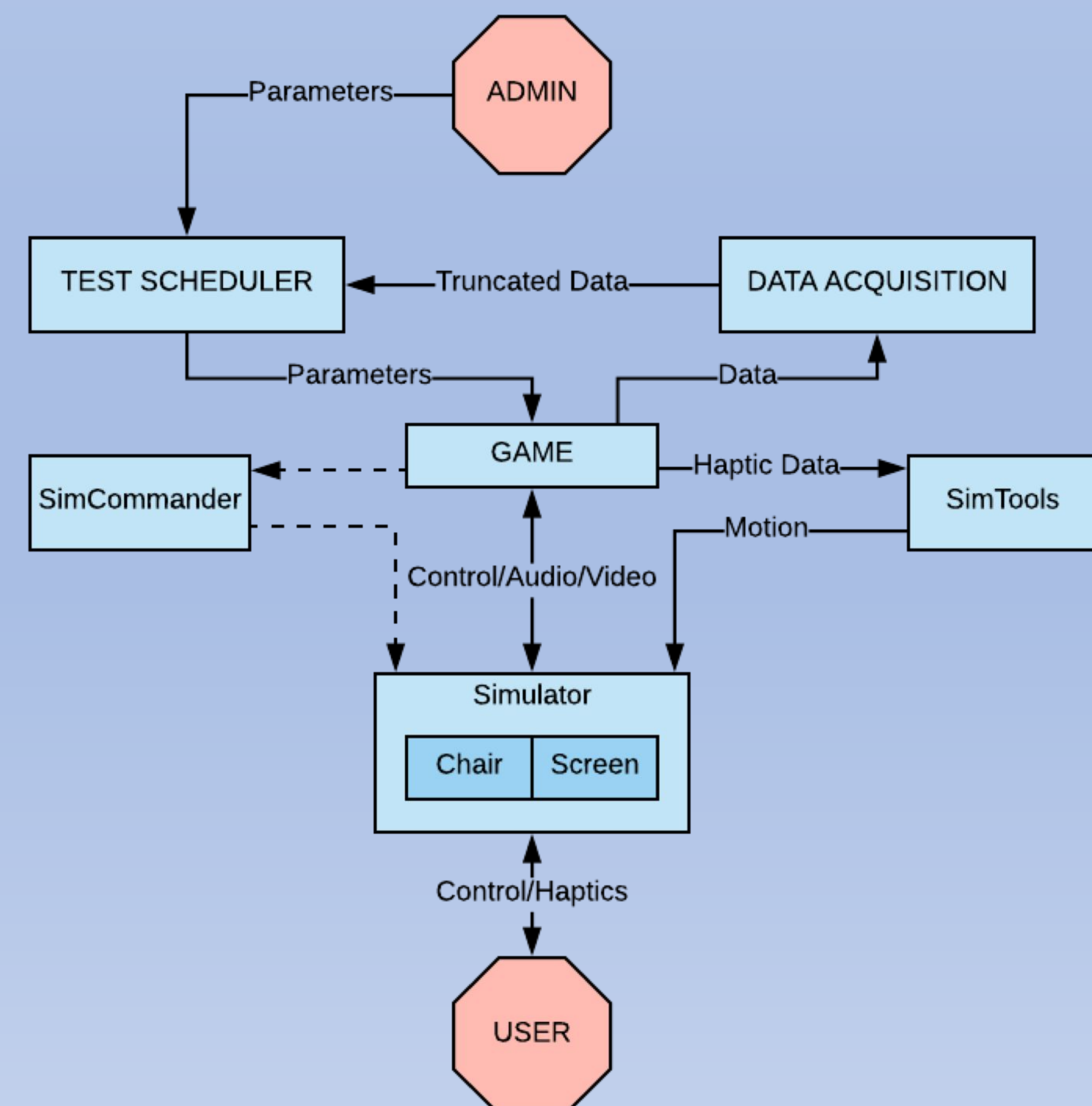


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Subsystem Divisions:

- **Experiment Scheduler** - The interface application that manages and launches all of the system's data and other top-level functions
- **Training Scenarios** - The system's user training mode
- **Test Scenarios** - The system's user evaluation mode
- **Telemetry Module (data acquisition)** - The system's capability to gather data on user performance via interaction with files and other applications
- **Trial Web App** - A web app used by researchers to record observational data about experimental subjects

The System:



Project Accomplishments:

- Each team member underwent Behavioral Research Training for certification on human subject research
- Developed the procedure and protocol for the research project
- Extensive fact-finding on APIs/SDKs and off-the-shelf products with which to work
- Designed and implemented a working Telemetry Module and Trial Web App
- Conducted research with subjects to test whether the haptic feedback improved learning relative to a static simulation - refer to figures below
- Built a custom data processing system for research purposes
- Created additional maps, courses, and different scenarios

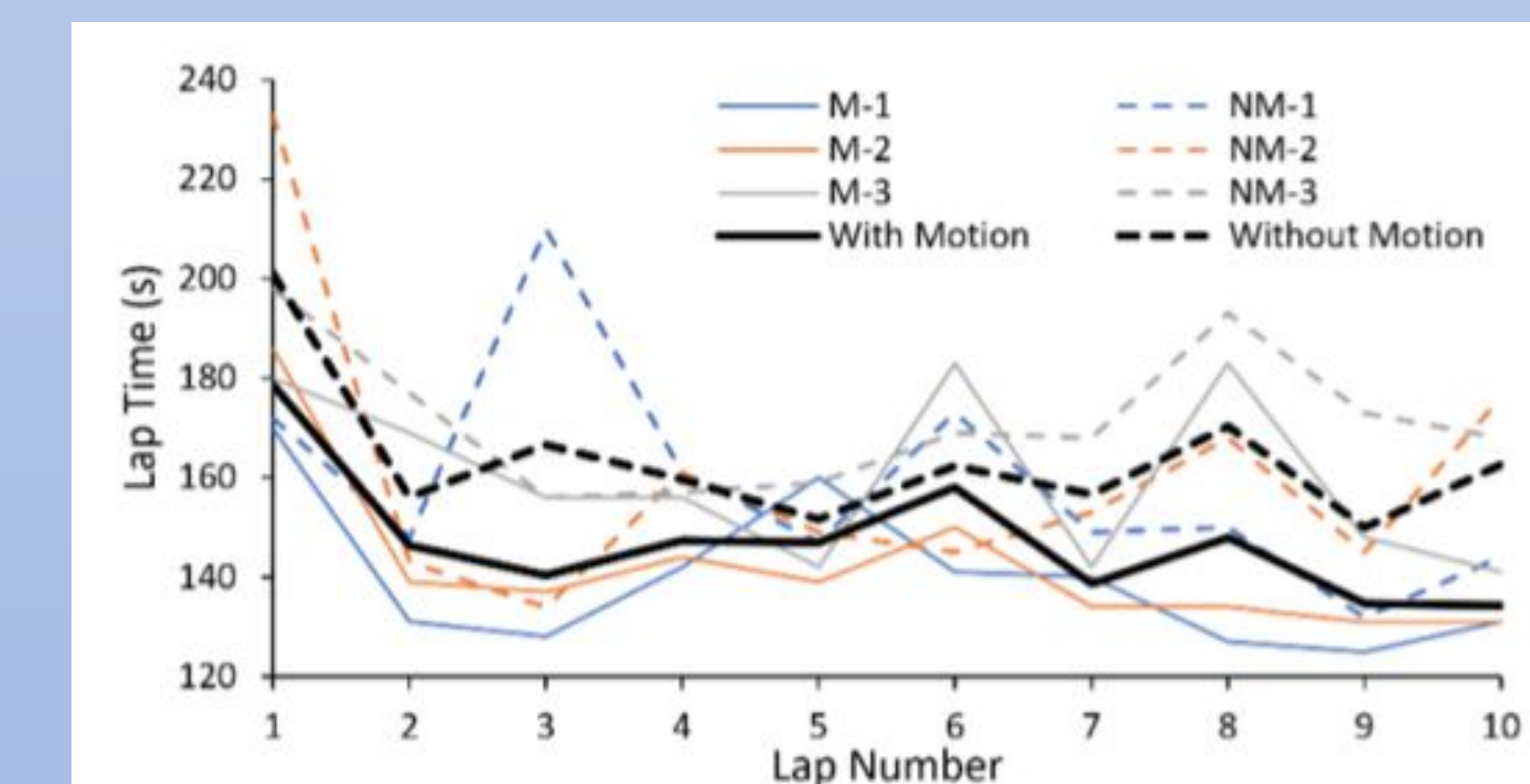


Figure 1: Lap times for participants with haptic feedback (solid lines) and without (dashed lines). Black lines indicate average for each sample population.

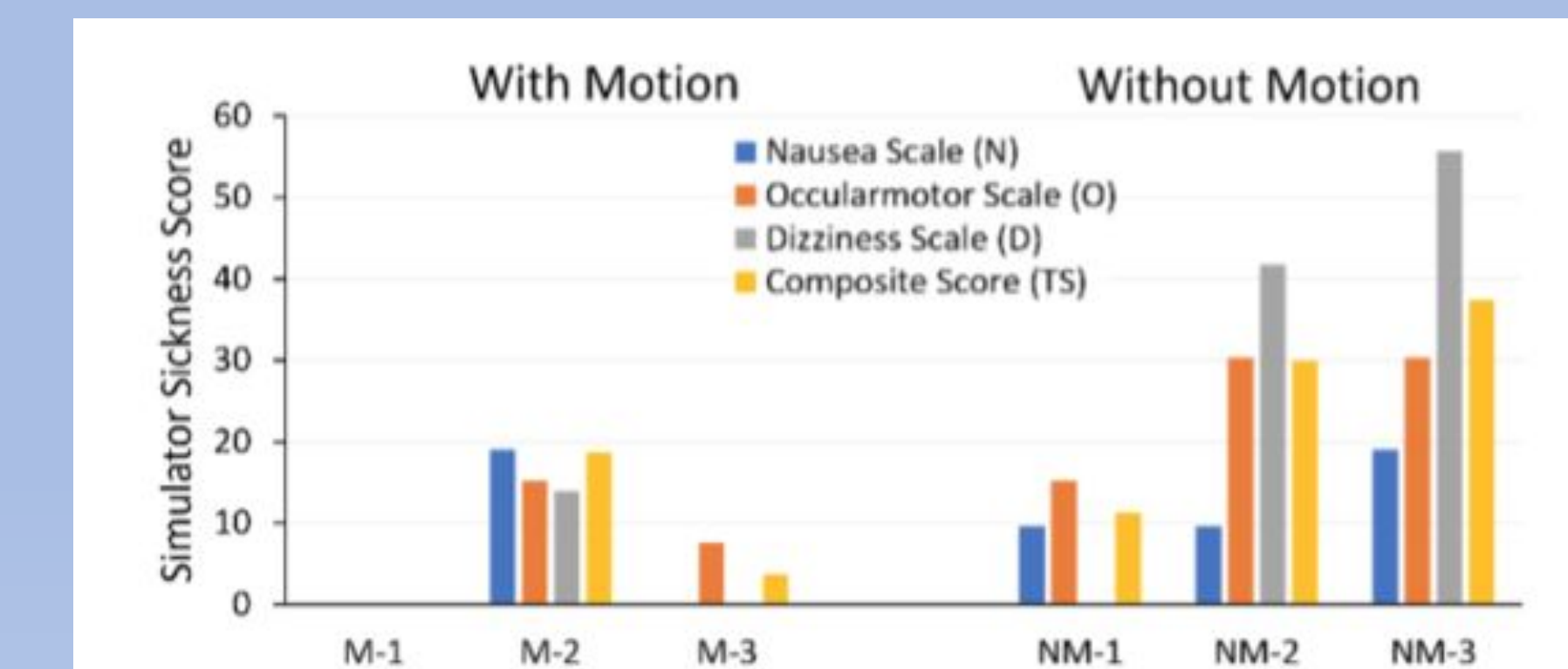


Figure 2: Simulator sickness scores for participants with haptic feedback (left) and without (right).

Technologies:

