Child development sensors

Engineering Tools to Capture Child Development in Real-World Contexts

Students in this project will work closely with researchers in Human Development & Family Studies, Psychology, Educational Psychology, Speech & Hearing Science, and Electrical Engineering to design, build, and test a wireless sensing technology to be used to safely and unobtrusively monitor physiological responses (heart-rate, skin temperature, respiration, etc.) in young children. The sensors will be embedded in clothing that is safe and comfortable for infants and toddlers, and data will be sent wirelessly to smart phones or tablets operated by researchers. The devices should be inexpensive, compact, readily manufactured, easy to use for both researchers and parents, robust, safe and nontoxic, and easily integrated with data collection/analysis software for iPhone or Android devices, and comply with applicable standards and regulations. The project may be extended to a second semester as an independent study course for highly motivated MechSE students who wish to participate in the research phase of the project.

Students will be required to sign over intellectual property developed in this project to the sponsor.

Background

- Desired by researchers in social sciences department
- Target age group – infants that are around 18 months
- No huge commercial push; marketed to researchers
- Open ended project – no restrictions to types/locations of sensor, etc.

Technical Requirements

- Able to monitor key physiological data, including ECG (want waveform, not just heart rate)
- Able to achieve the mentioned functionalities unobtrusively (no bulky equipment, electrodes)
- Light skin contact is okay (like sensors used in Fitbit, Apple watch)
- Able to transmit collected data wirelessly (asynchronous is okay, synchronous preferred)

Keywords

Wearable technology, child monitor, ECG, sensing

Sponsor

Engineering/Social Sciences Research Collaboration
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Professor Harley Johnson

Contacts

- Professor Harley Johnson
  htj@illinois.edu
  217-265-5468