Finalized ideas:

Drone:

* Build a ‘delivery’ drone that uses GPS location to go from one point to another.
* Use (laser) infrared sensors to avoid obstacle collisions.
* Uses an app to program source and destination (as well as round trip).
* Send a request through the app, the request is then accepted from the recipient
* LiDAR

Workout thing:

* Moosh haz this (heart rate monitor with a Kinect), no idea if it’s useful, but might be able to repurpose it:
* <https://www.amazon.ca/EA-Sports-Active-PlayStation-Standard/dp/B003TV5C3C?th=1>
* Sensors attached to arms, legs
* Feedback from app (sound output, on screen?)
* See table below

Mobile Game/App:

* What criteria does a mobile game have to have to fulfill embedded system requirements?
  + Likely has to use the microphone, camera, touch screen, vibrations, etc.

Advanced collision detection

Productivity application:

* If you waste too much time, application interferes with accessibility

NoteTaker:

* Able to transcribe notes from powerpoint or online lecture. Transcribe equations.

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| **Idea** | **Tasks** |
| Drone + App | What it is   * Delivery Drone (ex. for restaurants, delivery services, sports)   How will it work   * Avoids object collisions and navigation using IR laser sensors * Use GPS and location based services to fly drone to target and update host and target actively in the application. * App is designed to retrieve precise location before accepting the delivery from the drone (before the drone is dispatched).   If feasible   * Drone can be used to follow the user’s phone using bluetooth (sports)   Consider:   * LiDAR * Ultrasonic * ***Consider safety concerns*** * **Delivery/specialized delivery e.g. insulin** |
| Transaction Robot | * Robot Arm, pay at a distance |
| Workout Sensors + App | **General**   * Track posture and motion to ensure the exercise is being done safely * Track pace of repetitions (positive & negative) * Provide feedback through UI and audio in real-time, and for later if the user wants to review anything * Applicable to all forms of exercise: body weight exercises, resistance training, aerobic, yoga, even just stretching   **Extra Functionality – If Feasible**   * Infer quality of workouts and track statistics for the user * Include biometric information (from a connected smartwatch, other devices)   + e.g. heart rate can be used to provide guidance for aerobic exercises   **Sensors & Tracking**   * Use sensors external to the phone on body (arms, legs) to track rate of change of movement, angle of the joint * Sensors connected by bluetooth   + Number of sensors needs to be considered   + Positioning needs to be considered   + Method of attachment needs to be considered   ***Look into the sensors in terms of tracking***  **We have a Kinect** |
| General Mobile App |  |
| Game Mobile App | * Virtual Pet * Mini-games that use touch-screen * Might use AR camera like PokemonGo   + <https://www.polygon.com/guides/2019/3/4/18241355/pokemon-go-ar-snapshot-how-to-take-pictures> * Might use mic to talk to pet   ***Embedded systems features: raw data that you deal with directly (interacting with hardware, not necessarily low-level)***  ***E.g. microphone, gyroscope*** |
| Productivity Application | * Messes with the user for wasting time on certain apps * User can designate certain apps as “unproductive” * Using the unproductive app for too long causes screen flicker, random mouse twitches, random keystrokes, etc. |
| Note Taker | * Turns a screenshot of a lecture slide into OneNote notes * Can handle equations * Allows user to format notes |
| Tennis Ball Fetcher | * Retrieves tennis balls from the ground |
| Online “board game” (Chess/Checkers/Go/Shogi Board) | * Lets you play “over-the-board” with an online opponent * Recognizes moves made on the board * Moves opponent’s pieces automatically |
| Roomba that doesn’t cover my floor in dog 💩 | * Camera to detect objects to avoid * User sets objects to avoid * Mechanical device presses roomba buttons to trick it into thinking it hit a wall   ***Look into how we can modify a Roomba*** |