First meeting – mentors:

Shon – healthcare/pre-dental at PSU.
Margaret – pre-nursing at PSU.
Gabe – Computer Science at PSU.
Lucas – Computer Science at SEI

Team members (Jefferson High School Robotics team):

Daniel
Jonah
Jeremy

Deadlines – proposal due 3/13. What is the final result? Poster, presentation (prototype?)

Brainstorm – what are the issues facing the elderly?

- Memory
- Stigmatization
- Mobility
- Social issue (isolation, homes vs senior living facilities)
- Vision
- Taste

Jonah: What about iPhone/iPad app for improving memory? Games/exercises targeted at the elderly.
Daniel: ability to taste gets worse with age. Maybe some sort of technology or recipes to help with this?

Who should we speak to to learn more about these issues?
- seniors
- caregivers
- administrators?

Lucas: how about technology to help with social isolation – connect with family far away?

Jeremy: robot friend for the elderly?

Jonah: virtual reality to visit family members that are far away. VR headset type thing (oculus rift?)


Lucas: what about something that helps elderly stay in touch with photos and videos?

Daniel: Facebook for the elderly to see photos of their family.

Facebook to complicated/intimidating for people with no computer experience? What about people with poor eyesight?

Custom website for sharing/communicating that is easier to use and read. Would family members use it? Everyone already on Facebook. Custom website/app that makes facebook simpler and easier? How to do this? Would facebook let us?
Jeremy: more ideas on robots for the elderly – robot could help with medication and assisting with chores. How hard would this be to make? Would most people want a robot helping them out?

Jonah: how to make robots less scary/weird. Make small like a toy or pet?

What about a toy/pet robot for kids, but somehow connected to grandparents? So they can play together somehow. Lots of families far apart now and grandparents can’t always afford to visit or maybe can’t visit for health reasons.

Possibly combine iphone/ipad app and toy/robot? Uses the internet to allow grandparents to play with grandchildren by controlling the robot or playing games through voice/video.

What about something like the life alert necklace that can notify hospital/doctors during health emergency. How would it work? Similar to fitness band/bracelet. Monitors vital signs (pulse/blood pressure/blood sugar?) and notifies medical help if they are dangerous. Could also have health reminders, such as when to take medication, renew prescription, go to doctor for checkup. Possibly connected to robot for assistance? Dispense pills? Bracelet connected to the person’s doctor, provides health information to possibly reduce the need for checkup visits?

Would people use this? Concern about privacy. Possible discount on insurance if you use it?
Go over favorite ideas from last meeting:

- Jonah: App/tool/game to help improve/maintain memory
- Jeremy: Possible robotic technology to assist in walking
- Personal assistance like Siri, but aimed at need of elderly (what would it do?)
- Jeremy: companion robot – works with skype to communicate with family/friends
- Facebook for the elderly – what changes would need to be made?
- VR travel/tours. VR to communicate with family.

Jonah: App ideas: snapchat type service – makes it easier for family to communicate with elderly family member, so they might be more likely to do it regularly.

Siri-like assistant – how to make it work well? IBM computer that won at Jeopardy – they let people/companies pay to use this technology. Maybe that could be useful.

Health monitoring bracelet: how would it show information? Large screen would make it big and possibly uncomfortable – no one would want to wear it. Maybe some sort of projector, hold it up to a wall or table. They make very small projectors that might work for this. Would this require too much power? How to keep bracelet charged – not useful if you have to take it off to charge. Maybe fast charge technology so you only have to take it off for a short time?

How to get vital signs? Pulse is easy, lots of sensors for that. Possible to get blood pressure with bracelet? Tight fitting pad maybe – works similar to drug store blood pressure test. Can you measure blood sugar externally? Something with infrared or lasers maybe. What about an implant that communicates with the bracelet? Would people be willing to use that? Too invasive?
Interview / questions for elderly? Where/who to interview. Talk to grandparents? Make arrangements to visit an elder care facility and talk to residents/caregivers.

Homework assignments for next meeting:

- What are our best/favorite ideas? Come up with a clear description of each one.
- Set of questions for possible interview with elders / caregivers. What type of issues affect you that technology could solve? Do our ideas seem like something that would be useful?
- How to submit proposal? Gabe will handle it.
April 4, 2014

Daniel

This is our first meeting since the time before spring break. Our poster is due April 18, so we looked at the feedback that was given about our proposal together. What we found was that we should focus toward gathering more evidence for the claims we are trying to make “People in general do not like to go to the doctor”, we felt pretty confident that was correct, but it is up to use to research that and make sure that claim is backed by proof. intake area would include just having a schedule of when to take your medicine. How the data is checked would be cell phone data transfer to doctors/hospitals. There would be different “levels” of sensitivity of the device that are prescribed by the doctor. I thought of the idea that we give power to patients to lower the costs of insurance by showing that they are actually living healthy, with evidence. I talked to people and asked them if they liked to go to the doctors as my own personal survey.

Meeting notes:

Scope & Depth:

Q: What evidence do you have that as people age they do not want to go to the doctor’s office?

Jonah

Evidence of declining doctor visits?
Cancellations? Stubborn, Phobia?
Remote locations
Are there specific medical conditions for which this product would be the most useful?
What tech is available for the bracelet to measure these?

Daniel

Diabetes (blood sugar)
Hypertension (blood pressure)
Heart disease (heart rate)
Mobility problems (altimeter)
Medication schedule alarms
Need evidence of prevalence
Disease facts, figures, and trends

Creativity:

Q: What makes your idea innovative compared to other products available today?
A: Combines sensor technology with doctor communication to allow better health care over long distances, at lower cost (of insurance)

Human Impact:

Q: Have you asked your elders if they would wear the device? If they would, what do they see the benefit being? If they would not, what are they concerned about?
A: Need to arrange interview to describe our idea to elders and get feedback.

Technology focus:

Q: How is information transmitted, where is it stored, who receives it, and how is it used? Have you considered potential privacy concerns?
A:
- Transmitted via Cellular or Bluetooth to PC or mobile device
- Stored in existing provider information system
- According to privacy standards of provider
- Used as an additional source of information for doctors and nurses
- Low-cost with LED indicators

Research assignments for next meeting:

Jeremy: find out what sensor tech we can integrate into our bracelet
Daniel: determine which conditions we can detect with those sensors, and the prevalence and public health effects of those conditions.

Dylan: determine which diseases and conditions would require or benefit from the constant monitoring our bracelet provides, and the prevalence and public health effects of those conditions.

Jonah: research factors that keep people from going to the doctor, especially as they get older.
Symptoms and Diseases

One of the things this bracelet would constantly monitor is your blood pressure. There are many dangers when it comes to high blood pressure. One major one is damage to your heart. When you have high blood pressure your heart is working harder to pump blood than it should, this causes the heart muscle to weaken and not work as well. Eventually your heart gets to overwhelmed and may fail. Other heart issues caused by high blood pressure include higher risk of a heart attack, chest pain, irregular heart rhythms and in the worst case, sudden cardiac death. If you have low blood pressure you can become dizzy and lightheaded, and even faint. Being able to monitor your blood pressure constantly could be lifesaving for some because if your blood pressure is too high for too long it could be fatal.

Another thing monitored by this device will be blood sugar. Diabetes is the disease that will benefit the most from the constant monitoring because Diabetes is a condition where the blood sugar levels are too high. If these levels are uncontrolled they can lead to heart disease, stroke, high blood pressure, kidney disease, blindness, and nerve damage. If these levels are constantly monitored the user of the bracelet could focus on dropping the blood sugar levels. If you have low blood sugar you could expectantly pass out, or in worse cases have a seizure. It could even cause you to go into a coma or possibly die. If you have control of these levels these issues will not be a problem, and the bracelet helps you keep in control.

The last thing being monitored by this bracelet is your heart rate. Sudden changes in heart rate can be bad and even fatal. If your heart rate is too fast it can cause
dizziness/lightheadedness, chest pain, shortness of breath, and in rare and extreme cases unconsciousness and cardiac arrest. Slowed heart rate can damage your heart’s electrical system which can lead to coronary artery disease (narrowing of blood vessels) and heart attacks. If you had the bracelet and you noticed that your heart rate was too high/low you could talk to your doctor.

All of the diseases above could be more effectively controlled if you know your heart rate, blood pressure levels, and blood sugar levels, and the wrist band gives you the ability to see all of those measurements.

**Jonah (outline included):**

1. Why don’t people don’t want to go to the doctor’s office
   a. Can’t
      i. No/poor mobility
      ii. No money
      iii. No time
   b. Won’t
      i. Afraid (iatrophobia)
         1. Of costs
         2. Of What they will find out
         3. Of doctors
            a. What they do to you(don’t trust)
            b. Government conspiracy
      ii. Giving in
         1. To nagging of others
         2. To a ‘need’ to go

2. Other wrist bands
a. Fitness
   i. Fuel band
   ii. Flex bit
   iii. Jawbone

b. Health
   i. I found only one similar wrist band, it was exactly like ours
      1. 3 tier
         a. Wrist bad
            i. Wired probes
            ii. Wireless probes
         b. Company Server
            i. Stores data
            ii. Processes data
         c. Local hospital
            i. Tracks and stores data
            ii. Emergency-care sender

   ii. Personal health focus

Jeremy:

small pulse sensor that is the size of you finger tip, there is a thin kind of film that has a the ability to measure blood pressure and can come off as easily as a removable tattoo (http://news.ncsu.edu/releases/wms-zhu-silversensor2014/), there are also contacts that measure blood pressure. Several ways to measure glucose - IR sensors that are fine tuned to sense glucose (http://www.edn.com/design/medical/4422840/Non-invasive-blood-glucose-monitoring-using-near-infrared-spectroscopy)

Discussion:
Jonah found product very similar to our idea – how do they differ? How can we improve the idea? More research needed.

Poster design issues:

Need a picture/diagram of our idea. Use fuelband/life alert for reference.

Need a name for the product. Most good names using “band” are taken by fitness products. “LifeBracelet?” Need to do more brainstorming.

Need to arrange meeting to discuss our idea with elders.
More work on poster.

Research on names: Synonyms for “life”, or translation into other languages. “Vida”, “Vita”. Other names for “band”. Translations possibly a bad idea – what about unintended meanings?

Design for product diagram. Inspirations: Nike Fuelband, Jawbone Up, Fitbit Flex. Can anyone draw?

Similar product – Health Buddy. Larger, not wearable. What functions can be miniaturized?