12/8/2020 meeting with team:

11/20 meeting with Tyagi and Rover:

* defend end design and specify requirements (cost plus other additions adding value)
* final technology comparison, confirm whether price can be brought down (viable conclusion is that we cannot)
* Incorrect use of VR, wearable HMD with obscured surrounding
* **Main research questions for semester:**
  + **eye strain research question (how long can people use the headset)**
  + **how cheap can we make it**
  + **How secure can we make it**
* Don’t meet thanksgiving week, don’t meet early the following week
* Following meetings based on need
* Goals: order screens, order pi, buttons from DigiKey, scroll wheel
* Determine order of initially having the hardware
* Send out pole for availability close to beginning of next semester
* Research on lenses, vendor, focal length, google cardboard kit to get lens?
* Casing?
* Tao: launched server and connected to local host, problems past login
* Positions for now: Ehren and Asa on hardware, Nathan/Rob/Zach for Tao, Morgan for lenses

11/20 Meeting with Rachel:

* Concerns: what value is added from less developed VR headset
* Goal: comfortable (how long to be able to wear), secure, cheap
* We will break down what our headset can do versus existing headsets
* VR (interactive environment) vs HMD with obscured external environment
* Take existing headset, deconstruct and reconstruct if helpful
* User research on inputs (scrolls, buttons, etc)

**TODO over break:**

* **Order Raspberry pi Zero W**
* **Determine and order buttons**
* **Order screens (certain LCD?)**
* **Determine and order lenses**
* **Research headset casing options (removable and moveable lenses, how to fit in the hardware and buttons)**
* **Optics research (focal distance and distance between eyes)**
* **~~Pole for mtg time next semester~~**
* **Experiment with Tao**

11/16:

concerns for mtg with Tyagi:

* solution isn't the best option but it is what the client wants
* client wants fully working product, panel suggested narrowing to a single part
* morning meeting with Tyagi?
* push back mtg with Rachel to later in week

11/12:

* Rachel, Nathan, Zach, Rob, Morgan
* Tao issue with keyboard/mouse would be similar to any other existing test driver
* 5 other existing drivers in mind
* Driver dependent, university can use any driver like Tao
* Customizable headset with lens adjustment for astigmatism
* Duration of comfort in VR setting, find study, ask about AR comparison
* Rachel good with plan to start with basics and iterate adding additional features

11/10:

With Rover

* We’re realizing we’ve lost a month of school due to schedule changes due to covid
* Agile approach to development, always having a working prototype
  + Work towards a MVP, and then maybe additional features
  + Can work on future ideas if time allows
* TAO might not be a great experience, but it’s a prototype, using existing open source software provides a prototype faster
* Optics are questionable, not necessarily viable by us
* Potentially something to extend into future senior design teams next year

Just team:

* Hardware team: display, power, optics
* Software team: displaying test, tao modifications
* Implementation plan:
  + First step: keyboard/mouse, tao, 1 lcd screen, raspberry pi
  + Iteratively add: add VR lens, adjust the lenses (closer together - IPD, closer to eyes- focus), modify tao, all other future iteration steps
* Screens: loss of res in two screens but probably still fine, gpio header (split screen we would need to solder), triple gpio board (big), ips lcd (easier for split screen because spread out solder points), tmux for split screen terminal, 7 inch one screen
  + Go with cheap for now (ips lcd 240x320) $10.95, can upgrade later (gpio and hdmi)
* Raspberry pi 0W (wifi)
* Email: order parts over break, when to meet

11/9:

* All members present
* TAO
  + How to type and login
  + GPL, licensing problem, have to provide the source code in addition
    - If TAO source code is open source it would be less secure
  + University buys headset, plug in computer, signs student in, unplugs headset and seals up, gives headset to student, have user never know their password
    - How to sign into wifi (use manual keyboard) or have ethernet plugin
    - Resign in new student, disposable fuse so when casing broken into
  + How to prevent student from taking on headset
    - Could have only certain MAC addresses allowed, setup when university signs in
    - Make sure user has no access to linux terminal (configs and mac address)
  + Heavy modification to test to be able to download exam
* Optics
* Hardware diagram
  + Open source for single or double screen
* Software diagram
  + Change tao server to wifi module
  + Change test server to tao server
* References and appendices for design doc
  + Northstar, tao, google glasses, websites for research
  + IEEE citations or APA

11/4: Meeting with TA

Fixes for design doc

- fix 3.3.1, do a computer graphic

- justify use cases in 3.7 design plan

- implementation is only theoretical so far

- ask faculty mentor how much implementation we need

- show example of raspberry pi with lcd and text showing or Tao maybe or google cardboard

- ask him by email about talking to Tiyagi about the extent to which we need to implement

11/3:

* Research:
  + Cell vs wifi: 3G to be discontinued soon, US as tenth fastest wifi speeds in world
    - Hardware: raspberry pi (onboard wifi available or $5-10 upgrade, $70 Nova cellular modem, 3 or 4G Nimbelink $200)
    - MVP: wifi functionality, enable cellular later
  + Reason for raspberry pi: small computer, can load Tao
  + Glasses:
    - Can’t really support all types of corrective lenses
    - Need to allow people to wear glasses for their vision, as we can’t support correcting their vision with all the various prescriptions
    - Comfort of wearing glasses with the headset? (Big concern with Rachel)
    - Glasses a security concern
      * Current spy glasses on arm and bridge
      * Could just take the headset off so space between headset and face
      * Hard to obscure frames that could have the camera
      * In person techniques to inspect glasses, hard to see through camera
    - Smart contact lenses
    - **Eye strain data related to virtual image**
    - **Goal: Say 80% of accommodation of sight issues, acknowledge the limitation, do research on binoculars and adjustable lenses, ask optics expert (can it work with an LCD screen, do screens need to be split apart or connected, how taxing is an LCD on the eyes)**
  + Headset weight in front, imbalance, uncomfortable, consider helmet in future iteration
  + Tao
    - PHP
    - Can take a test with tao or create the test
    - Use tool for determining the format of tests we need to interact with and display
    - Attempt to talk to Tao about rendering the exams on say an iPad
    - **Next step: create an exam and take it on Tao through computer (is it a webpage, what is the format, is it an html page)**
  + Raspberry pi
    - Continued research on competitors (small linux boards)
    - Heat,price and weight comparisons are important
  + LCD screens
    - A few types
    - **Do we need two screens or can we split a large screen in half**
* Additional accommodations to consider:
  + Text to speech (would require audio)

11/2/2020:

* Hello world
  + Summary: Raspberry pi with lcd screen, output text on screen
  + Components:
    - Headset casing
    - Hardware and software for sending and receiving
      * Buttons on scroll bar interaction
      * Display to screen
      * Implement Tao eventually
  + First step: Create diagram of hardware/software
* Need to allow glasses
* Hdmi split is more complicated
* Lcds: near normal ($10-20), tft (wider viewing angles, 3.5 in $24), ips (color, response time, wider viewing angles, $35 for 5in)
* Questions:
  + How to mirror an image on both screens
  + Existing VR headset screen size
* Rob will make diagram of components
* Reviewed presentation, everyone add images and remove speech overlay once presentation copied

10/30/2020:

* Members: Rover, all members
* Went over sketch
* Not using phone for screen because security risk
  + Potentially use google cardboard as housing prototype
  + Potentially use phone as prototype
* **Need to look into lcd screens**
  + **Libraries available? Image processing, special qualities of the image?**
* Computing component sketch and port connections
* existing projects, project north star, files for 3D casing headsets, firmware, hardware
* Use lcd screen as a peripheral device by Arduino/raspberry pi, early prototype
  + Can look at image distortion of lenses at that point
  + **Determine resolution need of screen**
* **Ask ETG about product of interest, ask what we should be aware of**
* Discussion Monday on interests
* Potential conflict for Rover to attend, invite industry contact

10/27/2020:

* Members: all present plus Rachel
* Schedule: two weeks, dead week, finals week, during break schedule to be discussed
* Discussed research:
  + Wifi vs cellular:
    - Cellular: Arduino kits, $70+, 3rd party sim cards potentially possible
    - Multiple kinds of 3G, need to review speeds again
    - Pushing off the decision
    - Cellular would add a competitive advantage
  + **Download** vs streaming
    - Text vs video is different
    - Many influences: Connection, bandwidth, activity on local network
    - Size of files is an important factor in this decision
    - Downloaded full exam as a vulnerability? Vs question by question, based on how we store the data
    - Have a password to take exam at time of exam after download complete previously
    - Upload full test after complete
    - Official decision: download
  + Test drivers
    - File type
    - TODO: Look into Tao
    - University: existing tools like canvas etc
    - What would these clients’ tests need to be like to work with our interface
    - What if higher stakes? Does it need to be in a specific standard or can we translate it?
    - File size info to be gotten to us later, 10G would be a large version (with video)
    - External SD card for raspberry pi sometimes, adds additional vulnerability, would ensure 10GB
* Major limitation: when headset comes off answer locked and next answer not available until headset back on
* Tech considerations: timed test ability
* One test at a time for MVP
* May not be able to zoom based on pixel granularity
* Next steps:
  + more wifi vs cellular research (same hw and power for 2-4G?) (Rob)
  + More QTI research (Morgan)
  + Tao on raspberry pi 3 (Zach)
    - Raspian, debian
  + raspberry pi and competitors, OS support (Nathan)
* Lightning talk next week, prep by Monday and due runthrough
* Final presentation during dead week

10/26/2020:

* Upcoming assignment due Sunday (Q4 will be discussed on webex)
* Sign up for final presentation: November 16, 2pm
* Delegated speakers for in class presentation, probably next week?
  + Practice in next week’s mtg

10/20/2020:

* Look at Google Cardboard
* Four buttons needed: power, scroll, two select buttons
* 3D print something similar to Google Cardboard, future versions made from casting
* Equipment we have for testing: arduino, raspberry pi, google cardboard
* Arduino cellular chip to be used with Ardino’s pro boards (for example, portenta H7, dual processor, embedded microcontroller board, two cores used for some combo of main program/encryption/cellular)
* Questions:
  + (research) Do you need two driver boards for each eye display? Probably not, use two ports with same signal or split a serial port
  + (Rachel) What is the file type of the data before going to a test vendor
* Research on software
  + available libraries
  + how to render images on display
  + Arduino lcd has library for display
  + Control software
* Use basic file for testing if no access to test drivers
* Discuss lightning talk (Rob)
* Discuss design doc
  + complete Chapter 1, 2, and preliminary Chapter 3 (Design) & Chapter 4 (testing)

10/13/2020:

* Members: Rachel couldn't attend
* Arduino: megabits per second, cell is faster than wifi version

10/12/2020:

* Members present: all
* Discuss our research
  + Live stream vs download
  + Wifi vs cellular (to be added to before tomorrow mtg)
    - Arduino chip/antenna/Sim card from arduino $70, wouldn’t have to pay for it as a plan on prototype, use as production also or have different hardware?
    - Wifi would use computer as test “secure server”, cellular would use phone as test “secure server”
  + Live stream vs download
    - Depends on file size and person’s network
    - Download in advance in case of unstable network connection
    - Questions: how much memory capacity on headset, size of file
* Display visual
  + Battery backup, power supply components, weight considerations, where to place on head
    - If on back, more custom strap would be needed to allow power to reach the front
* Future research needed:
  + Near eye display (move lenses by mechanical knob, one or two screens?, how glasses work)
  + Expert in mechanical engineering for headset casing and lens movement
* Question for Rachel: Should we have multiple exams ready at a time on the headset?
* Set up meeting to play around with google cardboard
* **TODO: finish research before meeting, add to bio on website**

10/9/2020:

* Members present: all, Dr. Rover
* Forming (get to know team), storming (explore), norming, performing (developing)
* Timeline goal: be ready by next semester for weekly/bi weekly sprints, have scope figured out this semester
* TODO: Create a sketch of layers of software/hardware and the headset look
* Future question: what if user takes headset off during exam, would this be cheating
* Defined purpose: near eye display that presents questions and has input device other than keyboard
* Touchpad/ note tablet would be necessary else a major “curtain” to the end product
  + Simple test for this iteration, no need for written work
* Future research:
  + Near eye display
  + Existing 3D or other existing housing: <https://learn.adafruit.com/3d-printed-wearable-video-goggles/overview> <http://www.computationalimaging.org/publications/the-light-field-stereoscope/>
* Mtg next week tentatively canceled (send update next Friday)

10/6/2020

* Members present: all, Rachel
* Agenda
* Minimum Viable Product is MultipleChoice, correct?
* Accommodate glasses?
* VR(ish)
  + Pros
    - Cheap
    - Less complicated
    - Can’t cheat off your environment
    - Don’t have to deal with eye tracking being a privacy concern
  + Cons
    - Can’t use calculator
    - Can’t use notes
* VR decided
* No glasses, need ability to focus screen for poor eyesight
  + Hidden devices in lens, security concern
  + Don’t allow space to fit device inside headset, sensor inside headset to check for added devices
* Headset casing - padding material against face
* Revisiting internet vs cellular
  + Domestic, cost benefit analysis, security, coverage
  + Cost paid by school, testing program, user?
  + Account per headset with the cellular, someone lease for hardware
  + How easy is it to switch between cellular and internet
  + Bandwidth of internet is a limiting factor
    - What is the required bandwidth we’d need
* Next iteration consideration: small file sizes, custom file type
* Universal standards, existing drivers, current test delivery, what kind of packages, what type of data (text, jpg, etc)
* Real time vs all at once in the beginning (download), upload after finished or out of power (power down safely)
* Need to encrypt content on headset, if device opened encrypt data
* roseline.ai software
* live stream vs download
  + Get a password so test can be downloaded in advance, use password to access at time of exam, upload back to server when connected to internet/cellular
  + How fast for a file
* **Research to do:**
  + Wifi vs cellular (domestic, cost benefit analysis, security, coverage, bandwidth needs based on data size)
  + Live stream vs download
  + Size, type of file (Rachel)
  + Details about existing test drivers (vendors: prometric, pearson vue, psi, its, proctor U, yardstick in Canada,,question mark in UK, rosalyn.ai), goal to have abstraction that works with any driver, keyboard or mouse as expected input?

10/5/20:

* We need to limit feature creep
* Review professional responsibility assignment (due Oct 11)
  + : high importance
  + Financial responsibility: keep within reasonable budget, important
  + Communicate honestly with client: high importance
  + Health, safety, well being: high importance
  + Intellectual property: high importance, legal contract
  + Sustainability: medium importance (plastic used, power consumption)
  + social responsibility: high importance, privacy concerns, accommodate disabilities (headset fits even if glasses, hearing aid)
* questions/concerns:
  + Optics experts: how do the glasses in between eyes and headset lens affect the image
    - Oculus headset has dials to focus the lens (instead of wearing your own glasses)
* Headset ideas:
  + clip onto your own glasses? Empty frames if no glasses needed?
  + Should the headset accommodate people with glasses
* Display:
  + VR with screen would be easier
  + How far out does the screen have to be from the eye
  + Cloned screens for both eyes? One screen (would have to be farther away)?
  + Google Cardboard - use to see how screen is split
  + We aren’t creating an immersive environment, less effort than existing products
* Questions for Rachel:
  + Accommodate glasses
  + Ability to see notes/outside world
* TODO:
  + start setting up website (Nathan)
  + Add your own bio to website (everyone)

9/29/20:

* **Upcoming deadline:** 
  + **Design document due Sunday**
  + **Bi weekly report Sunday**
* **TODO:** 
  + **Design document**
    - **Add your content to design document (everyone)**
    - **Expected end (1.7), Asa**
    - **assumptions /limitations (1.6), Morgan/Zach?**
  + **Email Dr. Rover on updates Friday (Morgan)**
  + **Consider your interests for what to work on when we build the prototype**
* Members present: all but Ehren, plus Rachel
* buttons /scroll decided
* Leaving sensors for later
* Future iteration ideas
  + Calculator
  + Glasses support
  + Multiple languages
  + International connectivity
  + Note pad
* Data transfer: ssh, tls for wifi
  + Concern: limited bandwidth
    - Placeholder for later addition of cellular, Cellular would be expensive if u sing base station
* Research on new AR headset out, powered by plugged in (avoid battery weight)
  + Small battery for ensuring test ended correctly, backup
  + Larger battery in future iteration
* Presentation on display
  + Tamper evident (open hardware)
  + Optics research/ professional
  + Idea of vr is good for avoiding cheating but doesn’t allow interacting with paper
  + If AR, next iteration would add cameras
  + Limited use case not allowing paper/notes
  + Separate stylus and note pad, future iteration
  + Resolution and brightness are super critical, dont want to strain eyes
  + Use existing software (Rocket Notebook, etc) to be built upon
  + Focus knob for dialing in, may be complicated to make adjustable lenses
* Housing
  + 3D printed, other custom housing

9/28/2020:

* Members present: all but Ehren (sick)
* Discussed Gantt Chart, hours put in going forward
* AR concern: outside person can see test
* Research needs:
  + Encryption libraries
  + Display types (Nathan)
  + Cell vs bluetooth vs wifi
    - Cellular may be out of reach (no prebuilt piece without paying for data plan), hardware for creating your own cellular network is $500+
    - Routers, safety, email Dr. Jacobson to ask about secure device and secure server best way to communicate between the two with wifi/encryption, how to avoid man in middle, would you like to meet with us, device user not able to capture data (Morgan)
* **Meeting with Rachel tomorrow:**
  + Finish going through tech features/research
  + Questions:
    - Can the first iteration be just in the US?
* **Upcoming deadline:** 
  + Design document due Sunday
  + Bi weekly report Sunday
* **TODO:** 
  + Research
    - Display types (Nathan)
    - ~~Email to Dr. Jacobson (Morgan)~~
  + Design document
    - Add your content to design document (everyone)
    - Expected end (1.7), Asa
    - assumptions /limitations (1.6), Morgan/Zach?
    - ~~Acknowledgements, Gantt Chart (Rob)~~
  + Email Dr. Rover on updates Friday (Morgan)
  + Consider your interests for what to work on when we build the prototype
* Email response from Dr. Jacobson: “Using encryption between the server and the headset. You could something as simple as TLS, which there are open source libraries for. That way you could also authenticate the server and even the headset using the hardware addresses or some other ID. SSH is another protocol that could be used, again open source libraries. The choice will depend on the other libraries you are using and the O.S. as to which is easier to integrate. TLS is more of an O.S. layer and SSH is more application layer.”

9/22/2020:

* Members present: all, Rachel
* **TODO:**
  + Send NDA to Rachel, Rover, Tyagi (or other faculty person?)
  + Lightning talk
* Discussed scope:
  + Controls: headset buttons easiest (consider left/right hand, look into existing touchpads/scroll/buttons, touchpad can have ability to highlight etc), VR/AR would make hand tracking easier, eye tracking in existing proctored exam software, **final decision: headset buttons/scroll wheel/touchpad**
  + Display: need to acknowledge safety concern (doesn’t damage eyes), no flashing lights, zoom in ability, **final decision: TBD**
  + Sensor: Wise to use camera for future AI processing (AI is not part of MVP), **final decision: save space for now but don’t implement**
  + Data security: Encryption algorithm is outside of our scope, create framework to fill in encryption algorithm later, **final decision: TBD (placeholder encryption/look into pre implemented libraries)**
  + Data Transfer: Cellular may be more difficult to implement than bluetooth and wifi, more man in middle attack for bluetooth and wifi, **final decision: TBD**
  + Power: Can implement battery and power supply, **final decision: TBD**
  + Housing: money for existing housing or 3D print, **final decision: TBD**
* **MVP:** Static image, multiple choice, no camera/audio connected to test (outside proctor service), leave space for camera with eye tracking and external camera
* **Next level:** essay questions, internal/external camera/audio connected to headset, AI monitoring of environment, hand tracking, gyroscope (test taker movement)

9/21/2020:

* Members present: all
* **TODO:**
  + Review technical features document before Tuesday mtg
  + Send update email to Rover, determine next mtg time (next two weeks same time is unavailable)
* **Upcoming schedule:**
  + Lightning talk due Wednesday
  + Sign and return NDA by Tuesday
* Created technical features document and determine how to present it to Rachel

9/18/2020:

* Members present: all, Rover
* **TODO for next meeting:**
  + **Research topics:**
    - **Connectivity around world**
    - **Security (existing testing companies, etc)**
    - **Tech (existing products, etc)**
  + **Send update email to Rover, determine next mtg time (next two weeks same time is unavailable)**
* **TODO in next weeting:** 
  + **Determine questions to narrow down project with client**
* **Upcoming schedule: team assignment due this weekend**
* Prototype platform may not be the same as the final product (cost wise), we need to see what we can get with allocated money
* Went over hololens, vuzix blade, displelix and other headset options in market already
* Determine criteria to decide on tech used
* First draft of research/criteria done by Oct 4
* is AR less secure than VR?, determine AR and VR pros and con
* Need to understand current limitations with covid, how much can we work in a lab on the prototype
* Now is the time to pushback, define what is feasible, explore as much now as possible

9/15/2020:

* Members present: all, Rachel
* **TODO for next meeting:** 
  + **connectivity in general around world (SE Asia, Canada, Brazil, Africa, Nigeria, EU, other major testing locations)**
  + **Security, QTI, what standards are out there and what is not covered related to security of content, how does say Canvas act securely**
    - *ehren*
  + **technologies to use**
* **Upcoming assignments: team assignment due this weekend, individual assignment due wednesday**
* **Upcoming schedule: mtg with Rachel Tuesday 2pm, mtg with Dr. Rover Fri 1pm**
* Forms given to Rover: NDA, intellectual property, and one other?, Rob to send email following up
* Keep in mind: Accessibility, test security, cyber security
* Multiple options for integration
* White lists and black lists in lock down browsers
* Money paid to get through security: Varsity Blues, paid to get students into a school, athletes with lower scores
* Setup MIcrosoft Teams mtgs

9/14/2020:

* Members present: all
* **TODO for next meeting:** 
  + **connectivity in general around world (SE Asia, Canada, Brazil, Africa, Nigeria, EU, other major testing locations)**
  + **QTI, what standards are out there and what is not covered related to security of content, how does say Canvas act securely**
    - *ehren*
  + **technologies to use**
    - Morgan
* **Upcoming assignments: team assignment due this weekend, individual assignment due wednesday**
* **Upcoming schedule: mtg with Rachel Tuesday 2pm, mtg with Dr. Rover Fri 1pm**
* **Agenda with Rachel:**
* **Agenda with Dr. Rover**
* Agenda: review design thinking document, Dr.Rover’s email, how does a secure test work, tech brainstorming (mind map)
* We need to be answer questions posed about monitoring devices, what are we doing with the data
* Aware of market condensed if schools move toward open note/book, but still existence of personal standardized testing
* Inform teachers and students about what data is used and how it is being used
* Security: flagged 20 seconds for proctor to see, anything else only used by AI
* **Note to Rachel:** advisor told to keep in mind privacy concerns for take home exams and open book/note exams, address our ideas above
* Team process/steps
  + What does headset have to do
  + How to securely take test
  + Iterate to improve finished prototype
* Assigning parts for design document
* Use sonar or radar sensors
* Live video feed (needs to be very accurate/many frames per second or not very accurate with just shapes/outlines of surrounding environment) verses through glass
* Question:why AR needed verses VR
  + VR avoids distractions, but could get disorienting
* Be aware of if headset removed during exam
* Brainstorm visualization tool: draw IO
* Develop app for google cardboard API, as a prototype

9/11/2020:

* (meeting recording done by Rob but there were connection issues, might not have been saved)
* Members present: all of team, Dr. Rover
* Intros with Dr. Rover
* Team experience/interest:
  + Zach - cpre arch, lower level software
  + Ehren - microarch, ee credits done
  + Asa - hardware
  + Nathan - software experience, interest in circuits/microcontrollers
  + Rob - software, just started ee requirements
  + We may want to go deeper into determining interest/experience before dividing tasks
* Debrief of project and company, went through presentation
* Big hurdle: secure data transfer from testing server to headset and back
  + Need cybersecurity connection
* **TODO: Need to discuss our strengths and where learning is needed and what tech to use**
* **TODO: Market study, compare existing features, look at datasheets, look into how for example** Canvas encrypts/secures exams
* Dr Jacobson, in security, exploring testing environments
* Oculus quest, last year senior design, <https://sdmay20-33.sd.ece.iastate.edu>, use for testing, is it viable for use in end product pricewise?
  + Need comprehensive environment monitoring, does that exist in currently marketed headsets? Can we integrate with existing sensors?
  + Prototype could use more expensive headset to show how it would work
* Need to articulate the value of headset over lock down browser with webcam, value in close proximity environment
* Use webex or something else for longer meetings
* Ask course instructor about NDA to professors

9/8/2020:

* (no mtg recording for today - oops)
* Members present: all of team, Rachel
* Rachel will look at NDA papers
* Gaming console option for headset interaction, stand alone preferred
* Bluetooth or wifi, which is more secure?, reach out to cyber security experts
* Highly targeted credentials/exams
* May be used in other countries
* Disconnected in that if connection drops, can still finish exam
* Be able to charge during (maybe USB), battery backup
  + Don’t want purposeful battery/charge dying mid exam
  + Charging indicator, charge level
  + Require to be plugged in (not ideal)
  + Warning and Agreement, items submitted that were completed if headset dies
  + Log battery charge before test to prove it doesn’t die during exam
* Approach cynically (attempts to cheat)
* Log equipment info throughout exam
  + Battery life
  + Check for printing, cut/paste, screen recording, other functionality from computer that is connected to headset
* Security of server to headset and back again
  + Data plan per headset, price?
    - Cannot control whether a certain provider reaches a given location
    - Have pros and cons listed once decision made
    - Infrastructure doesn’t currently fully support online education in general, international cellular or internet coverage
  + Another way to avoid test data being on user’s computer directly (encryption, etc)
  + Ask cyber experts
* In hw: measure battery charge
* In sw: notify user about battery level, eye tracking
* Cheating sensory techniques:
  + Eyes, hands, hearing
* Lockdown browser for computer
* Outward cameras and inward camera (eye tracking, mouth movement), coordination between both
* Keyboard input not allowed in exam
* Current work in field: Capturing info to determine whispering happening and what is said
  + Have audio/video saved for processing later (future goal: real time processing)
* First prototype December, better in May
* Future meetings - Length of meetings for September: 1 hr; dates: 15, 22 (2:15) re-evaluate cadence of meetings
* **TODO**
  + for next mtg: review design document, NDA forms, items to research (connectivity in se asia, canada, brazil, africa, nigeria, EU; QTI understanding, what is out there and what is not, security of content; cyber security resources, technologies to use)
  + For tomorrow: audio recordings added and final version submitted
* **Agenda next mtg**: Tentative project plan, design document review

9/7/2020:

- Members present: all of team

- worked on outline for lightning talks

- put in google drive

- added speaker notes and slide content

- assigned speakers for each slide

- To Do::

- upload audio by mtg tomorrow

- confirm transitions with audio works before submitting presentation Wednesday

- Rob send email to Rover about mtgs

- mtg with Rachel tomorrow:

- determine consistent time for mtgs (potentially Tuesdays 2-3 from now on)

- review slides

9/4/2020:

- Members present: all of team, Rachel

- Rachel: attorney, secure tests now

- secure test vs webcam view

- better secure test taking experience

- weaknesses exploited by test takers, make more secure

- NDA: yes, forms from isu, send forms to rachel and chris

- use cases: online to be taken at home, wgu online university as ex, testing center (already secure setting)

- requirements: durability, secure (tamper protected), comfortable, high quality (not pixelated), cheap

- stand alone device if possible?

- 350,000 dollars a form for standard tests

- AR headset

- interaction options: buttons on head (user discomfort?), hand gestures, button hand device (disconnected could get lost)

- voice - privacy (what are you recording in environment), security (copy answer), disruptive to others around in testing environment

- MVP - minimum viable product

- question types: drag and drop, mix and match, short answer, essay

- api to display survey, interact, and record and send back

- what extent monitor environment: eye tracking, image processing or recording for future review?, use existing tech, can turn off privacy/monitoring, audio record, needs a lot of AI data (not mature enough now, flag recording run through AI), flag but not distract

- proctor: jump into session? chat function,

- use with or without proctor (record and review)

- current proctor: webcam, cannot see behind camera, move camera around

- download from driver to headset, internet independent

- or internet connection and send each question directly

- LTI

- versatile to lay over any driver/test source

- record and continue test even if internet down, chat/proctor connection may be down

- compliance with QTI (file standards?)

- goal: combine components securely, proof of concepts

- cost effective, prototype may not be used in field

- updates on progress, questions, where we are headed, agile or weekly mtg

9/1/2020:

* Members present: all of team
* Went over reflection
  + Determined team positions and responsibilities (other general responsibilities not included below are in table 5 in 491\_reflection\_01a.pdf of Reflection assignment)
    - **Meeting Scribe:** (Morgan)
      * Video record all meetings
    - **Meeting Facilitator:** (Rob)
    - **Report Manager:** (Nathan)
      * Bi weekly report
      * Trello maintenance
    - **Chief Software Engineer:** (Ehren)
    - **Chief Electrical Engineer:** (Asa)
    - **Test Engineer:** (Zach)
* We created a contact sheet (only use for high importance notification)
* Next mtg time: Tuesday 2-3pm
* TODO:
  + Contact industry advisor again at the end of this week (Morgan)
  + Set up mtg time with university advisor (Rob)