Driver Alertness Sensor Group Meeting Records

30/04/2018	Meeting with Client on Skype
Venue Library Study Room **Attendance** All	**Agenda** - What driver status is expected to be detected, and how? (Is computer vision and face recognition a viable solution to explore?) Main status to detect is "falling asleep", but other patterns can be detected too if we want to (such as going off road, getting eyes off the road too long, turning the steering wheel in an unusual way). Computer vision should be implemented if ARM can provide us their board with an embedded camera (depends on legal agreement with Imperial since this new board isn't opened to the general public). - What should we do if driver is found to be drowsy? Initial idea is to ring an alarm. We will have to look at the competition to see what has already been implemented in the market. - What type of user interface does the Client require? An App would be good, other ideas are welcome as long as they don't require the driver's attention when he drives. - What can ARM provide for us? There are no offices in London, Mr. Harrod will try to bring some powerful chips from Cambridge. Otherwise, we will still have access to some ARM boards but that won't have an embedded camera. (Cortex Arm M7) If we use other microprocessors, careful with computer vision libraries that will probably be limited (hard to build everything from scratch). - Is there any advice on where we should get started? Think about hardware first, make sure it's capable for the algorithm we intend to use. Do some market research before starting. - Is there any particular rule for the demonstration? It depends on what system we built but need to show something work. - How can we refer to ISO26262? Our client will break the standard down for us, extracting a short summary of the standard that we can follow. **To-do List** Prepare a list of requirements that will be tested on the demo day. If we can't use the powerful ARM chips, computer vision might be dropped for another solution.

03/05/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - Split team members into sub teams. Software: Valentin, Martin, Wenjia, Edward Hardware: Kexin Commercial: Lillian - Analyze existing competitors and facing challenges in detail. - Analyze the technical implementation of already existing solutions and how they were designed. - Each person is assigned a task according to their skills. - Set up group accounts: Google Drive, GitHub. **To-do List** Valentin and Martin: Research on four boards and computer vision algorithms. Wenjia: Learn online tutorials on how to develop an iOS App. Edward: Research on communication between algorithms and iOS App. Kexin: Record group project process and make Gantt Chart and Milestones Chart. Lillian: Research on marketing and do leaflet.

04/05/2018	Meeting with Client at Imperial
Venue EEE Room 610b **Attendance** All	**Agenda** - According to the client's previous emails, our group did some research on four different boards and he brought two boards (STM32F746G Discovery Board, Nordic nRF51-DK Development Kit) for our group to use. - Client introduced arm functional safety and security according to ISO26262 standards to the group. - The group expressed general ideas on how to implement the driver alertness sensor. For example, face recognition technology, accelerometer installed in steering wheel to measure car direction and rotation, etc. - Present final proposed solution, discuss components required for it. - Invitation to arm at Cambridge to show final product. **To-do List** Continue doing research on boards. Decide which board to use and research on whether or not to buy additional camera module.

07/05/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - Final decision on using Raspberry Pi 3 B+. - Appoint Valentin as the team leader. - Check on each team member's progress. - Decide what do we send over Bluetooth. Ideally, processor does all the work and just sends a signal when drowsiness is detected. - Prototype of a car seat on EEE 11th floor. - Order Bluetooth and Camera modules through EEStore. - Order the Raspberry Pi 3 B+ and a 32GB SD Card. **To-do List** Waiting for the products to come, continue research.

09/05/2018	Meeting with Imperial Supervisor
Venue EEE Room 506 **Attendance** All	**Agenda** - Abandon additional sensor but add more features to detect on CV algorithms. - Check on each team member's progress. - Read resources found by team members. **To-do List** Valentin, Martin, Edward: Continue doing research. Wenjia: Develop iOS app. Kexin: High level interface sketch. Lillian: Leaflet.

11/05/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - Develop both iOS app and android app. - Start Bluetooth shield algorithms. - Start eye detection algorithms. - Basic testing on board. - Research computer algorithms. - Background for app created roots. **To-do List** Add more features on iOS app, try to do android app. Add music selection function in the app. Make Bluetooth communication work.

16/05/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - To reach biggest market size possible, make device available even for users without a phone. - If the user forgot to bring their phone, the device can still work. - Drop the idea of android app. **To-do List** Make yawn detection work. Add animations on iOS app. Running the program when the system has finished booting up: implemented.

18/05/2018	Meeting with Client on Skype
Venue EEE Room 610 **Attendance** All	**Agenda** - Keep client up to date on our group progress and future work. Ask for advice and opinion. - Prototype of driving seat. - Finished sleeping detection and yawning detection. - Bluetooth connection between app and Raspberry Pi. - Idea of 3D printing a case for Raspberry Pi and camera module. **To-do List** Bluetooth communication. User communication with LEDs and alarm. Design a case and 3D print it. Continue doing the leaflet.

21/05/2018	Meeting with Imperial Supervisor
Venue EEE Room 610 **Attendance** All	**Agenda** - Keep supervisor up to date on our group progress and future work. - Check each team member's progress. - Show supervisor our leaflet and ask for advice. **To-do List** Continue developing algorithms and Bluetooth. Continue designing 3D case. Continue doing leaflet.

24/05/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - Arrange what our group needs for the demonstration. Two screens: One screen with a video showing one of us using our product on the simulator in the EEE building. Edit the video to add marketing arguments. Another screen which displays how the algorithm detects eyes and mouth. - Finish connecting everything together. **To-do List** Buy another camera module. Improve the app, make it look nice and smooth. Improve algorithm: Cluster Rat? Overclock? Run Raspbian Lite Instead? Check other ways to run program at reboot. Build curved dashboard. Create a fake prototype. Buy a steering wheel for demonstration use.

31/05/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - 3D printing case finished. - Split documentation tasks to each team member. **To-do List** User Manual: Martin, Edward Report: 1. Specification: Lillian 2. Market Research: Lillian 3. Project Plan: Kexin 4. Design taken with Rationale: Martin, Edward 5. Design History: Martin, Edward, Kexin 6. Material Sourced and Used: Martin, Edward 7. Testing: Martin, Edward 8. Ethical Consequences: Wenjia 9. Sustainability: Wenjia 10. Reference: Everyone 11. Meeting Records: Kexin 12. Putting everything together: Valentin Leaflet and Poster: Valentin

04/06/2018	Meeting with Imperial Supervisor
Venue EEE Room 611 **Attendance** All	**Agenda** - Keep supervisor up to date on our group progress and future work. - Show supervisor the final draft of our leaflet. - Ask for advice on demonstration and documentation. **To-do List** Construct two cases bought online. Continue doing documentation.

06/06/2018	Group Meeting
Venue EEE Room 506 **Attendance** All	**Agenda** - Take picture of the whole group in front of EEE building for the leaflet. - Take picture of the 3D-printed case. - Buy another camera. **To-do List** Continue doing documentation. Final check on leaflet. Start doing poster.

11/06/2018	Meeting with Client on Skype
Venue EEE Lab **Attendance** All	**Agenda** - Keep client up to date on our group progress and future work. - Show client the poster and get some suggestions. - Re-do the camera case. **To-do List** Continue doing documentation. Finishing the poster. Re-do the camera case.