FireGuard – Meeting Minutes

Texas A&M University at Qatar

Electrical and Computer Engineering Program

ECEN 403 – Senior Design Project

Team #3 – FireGuard

1. Meeting Information

Item	Details
Date	September 10, 2026
Meeting with	Dr. Jim Ji
Meeting type	Technical Consultation
Duration	Approximately 28 minutes
Location	TAMUQ
Attendees	Moza Al-Mannai, Aisha Al-Khalifa, AlReem Al-Ghanem, Shaikha Al-Sulati
Meeting objective	Discuss sensor selection, system feasibility, and the proposed concept of operation.

2. Meeting Agenda

- Evaluate suitable occupancy detection technologies.
- Discuss privacy, reliability, and cost considerations.
- Explore communication methods for firefighters.
- Define the initial implementation scope.
- Discuss system design and technical challenges.

3. Discussion Summary

3.1 Sensor Technology

- Discussed mmWave radar as the preferred technology for occupant detection.
- Identified potential limitations of infrared and thermal sensors under fire conditions.
- Considered skeleton detection and door-based occupancy counting as alternative solutions.
- Discussed the complexity of integrating separate door sensors.
- Identified the need to investigate mmWave radar's room-scanning capabilities.

3.2 Privacy, Cost, and Practicality

- Discussed the limitations of camera-based systems regarding smoke visibility and occupant privacy.
- Favored non-camera-based sensing technologies.
- Discussed prototype costs and potential cost reductions through mass production.
- Identified simple occupancy detection as potentially sufficient without requiring high-resolution radar.
- Considered alternative component suppliers to reduce costs.

3.3 Firefighter Data Access

- Discussed using an Android device to display occupancy information to firefighters.
- Explored Bluetooth communication and cloud-based data storage.
- Considered placing a protected tablet at the building entrance for emergency access.
- Discussed safety concerns associated with relying on security personnel to deliver the device.
- Considered government and resident cooperation for future implementation.

3.4 System Design and Operation

- Discussed prioritizing system integration rather than developing a new sensing device.
- Identified sensor sensitivity, reliability, and battery life as research considerations.
- Discussed maintaining hardware simplicity while implementing detection and communication through software.
- Identified stationary occupant detection as a technical challenge.
- Discussed the need for communication modules and decision-making algorithms.

3.5 Related Technologies

- Discussed existing gesture and skeleton detection technologies.
- Considered Wii and EyeToy technologies as examples of earlier detection systems.
- Discussed reliability limitations associated with earlier technologies.

4. Key Outcomes and Recommendations

- Prioritize mmWave radar for further investigation.
- Focus on camera-free occupancy detection to preserve privacy.
- Initially target public buildings, particularly schools and hospitals.
- Consider residential implementation as a future extension.
- Focus on integrating existing hardware with software and communication technologies.

- Investigate practical methods of providing occupancy information to firefighters.
- Prepare technical justifications addressing cost, reliability, feasibility, and project novelty.

5. Action Items

No		Action Item	AssigneTo
1	Research mmWave radar room-scanning capabilities.	Project Team	TBD
2	Investigate component cost reduction strategies.	Project Team	TBD
3	Explore integration methods with existing fire alarms.	ProjectP	

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1. Meeting Information

Item	Details
Date	September 17, 2026
Meeting with	Dr. Jim Ji
Meeting type	Technical Consultation
Duration	Approximately 6 minutes
Location	TAMUQ
Attendees	Moza Al-Mannai, Aisha Al-Khalifa, AlReem Al-Ghanem, Shaikha Al-Sulati
Meeting objective	Discuss hardware integration, mmWave radar selection, and preparation for the upcoming presentation.

2. Meeting Agenda

- Discuss hardware components and system integration.
- Review the selected mmWave radar technology.
- Explore communication between the sensor and Android tablet.
- Prepare for the upcoming project presentation.

3. Discussion Summary

3.1 Hardware Integration

- Discussed using a Samsung A10 Android tablet as the main display interface due to its ease of programming.
- Discussed using a microprocessor to handle signal processing.
- Identified the microcontroller's role in transmitting occupancy data.
- Discussed displaying received occupancy information on the tablet for firefighters.

3.2 mmWave Radar Sensor

- Selected Texas Instruments mmWave radar technology for occupant detection.
- Reviewed sensor capabilities, including people counting and waiting-time monitoring.
- Reviewed an example of radar data visualization.

- Discussed connecting the radar sensor through a microcontroller rather than directly to the tablet.
- Considered using an Arduino and Wi-Fi module to enable wireless communication.

3.3 Presentation Preparation

- Discussed demonstrating the capabilities of the selected mmWave radar.
- Recommended focusing on sensor data readings rather than visual representations during the demonstration.
- Discussed presenting the proposed hardware components and their connections.
- Recommended including screenshots and connection examples provided by the manufacturer.
- Discussed preparing the presentation for the upcoming Sunday or Monday.

4. Key Outcomes and Recommendations

- Use Texas Instruments mmWave radar for occupant detection.
- Use an Android tablet as the firefighter interface.
- Investigate microcontroller-based integration and wireless communication.
- Include manufacturer-provided connection examples in the presentation.
- Demonstrate the radar's capabilities through available sensor data.

5. Action Items

No.	Action Item	Assigned To	Deadline
1	Add screenshots and manufacturer connection examples to the presentation.	Project Team	Before presentation
2	Prepare a presentation showcasing the Texas Instruments mmWave radar demonstration.	Project Team	September 20–21, 2026 (tentative)
3	Complete and submit the presentation.	Project Team	To be confirmed

6. Next Meeting

Date: TBD

Proposed discussion topics:

- Hardware component selection.
- Radar and microcontroller integration.
- Wireless communication implementation.
- Presentation review and feedback.

7. Meeting Conclusion

The meeting focused on refining the proposed FireGuard hardware architecture and preparing for the upcoming project presentation. Texas Instruments mmWave radar was selected for occupant detection, while microcontroller-based communication and an Android tablet were discussed as components of the proposed system. The team will prepare a presentation demonstrating sensor capabilities and explaining the planned hardware integration.

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1. Meeting Information

Item	Details
Date	September 22, 2026
Meeting with	Dr. Jim Ji
Meeting type	Technical Consultation and Presentation Review
Duration	Approximately 8 minutes
Location	TAMUQ
Attendees	Moza Al-Mannai, Aisha Al-Khalifa, AlReem Al-Ghanem, Shaikha Al-Sulati
Meeting objective	Review the project presentation, clarify team responsibilities, and discuss project development and intellectual property opportunities.

2. Meeting Agenda

- Review the presentation content and introduction.
- Discuss fire statistics and supporting evidence.
- Review the proposed system operation.
- Clarify team responsibilities and software integration.
- Discuss testing, documentation, and intellectual property opportunities.

3. Discussion Summary

3.1 Presentation Content

- Discussed introducing the project through a case study highlighting the limitations of traditional fire alarms.
- Reviewed the proposed system operation using an emergency scenario.
- Presented an example in which a fire is detected in Room 101 while an occupant is located in Room 204.

- Discussed displaying room-level occupancy information on an Android tablet to assist firefighters during emergency response.

3.2 Fire Statistics and Supporting Data

- Discussed difficulties in obtaining Qatar-specific fire statistics due to confidentiality and access restrictions.
- Identified the potential requirement to submit a formal request to the relevant ministry.
- Discussed differences in emergency response capabilities across countries.
- Recommended incorporating worldwide fire statistics to strengthen the project motivation and problem statement.

3.3 Project Structure and Team Responsibilities

- Reviewed the estimated project budget and required tools.
- Discussed the distribution of hardware, software testing, communication, and application development responsibilities.
- Identified the need to clarify responsibility for software integration and room identification.
- Emphasized the importance of integrating the communication subsystem with the application and occupancy detection system.

3.4 Documentation and Project Development

- Discussed future testing, documentation, and system verification activities.
- Reviewed the presentation conclusion and received positive feedback.
- Recommended reviewing existing literature and commercially available products.
- Discussed the possibility of submitting an intellectual property disclosure and exploring potential patent opportunities.

4. Key Outcomes and Recommendations

- Strengthen the presentation introduction using relevant fire statistics.
- Clearly illustrate the system operation through a practical emergency scenario.
- Finalize the system operation flow diagram.
- Clarify individual responsibilities, particularly software and communication integration.
- Continue reviewing existing technologies and related research.
- Investigate intellectual property disclosure opportunities.

5. Action Items6. Next Meeting

Date: TBD

NO	Action Item	Assigned To	Deadline
1	Include worldwide fire statistics in the presentation.	Project Team	TBD
2	Finalize the system operation flow slide.	Project Team	Before presentation
3	Clarify communication and software integration responsibilities.	Project Team	TBD
4	Prepare and finalize the conclusion slide.	Project Team	Before presentation
5	Review existing literature and commercially available products.	Project Team	TBD
6	Investigate the possibility of submitting an intellectual property disclosure.	Project Team	TBD

Proposed discussion topics:

- Updated presentation content.
- Finalized team responsibilities.
- System architecture and software integration.
- Literature review findings.
- Intellectual property disclosure requirements.

7. Meeting Conclusion

The meeting focused on reviewing and improving the FireGuard project presentation, clarifying team responsibilities, and strengthening the project motivation through relevant fire statistics. The importance of demonstrating the system operation through a realistic emergency scenario was emphasized. Further research, system integration, testing, documentation, and potential intellectual property opportunities were identified as upcoming activities.

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Team #3 – FireGuard

1. Meeting Information

Item	Details
Date	October 20, 2026
Meeting with	Dr. Jim Ji
Meeting type	Technical Consultation and Procurement Review
Duration	Approximately 4 minutes
Location	TAMUQ
Attendees	Moza Al-Mannai, Aisha Al-Khalifa, AlReem Al-Ghanem, Shaikha Al-Sulati
Meeting objective	Review hardware requirements, component procurement, project budget, and final presentation preparations.

2. Meeting Agenda

- Review hardware and power supply requirements.
- Discuss component procurement and backup equipment.
- Review the estimated project budget.
- Discuss the final presentation timeline.
- Review future project development opportunities.

3. Discussion Summary

3.1 Hardware Requirements

- Discussed using a microprocessor with integrated Wi-Fi capabilities.
- Discussed battery-powered operation for the processing unit.
- Reviewed the fire alarm's primary wall power supply and backup battery.
- Identified the existing fire alarm speaker as sufficient for audible alarm notifications.

- Discussed using the tablet's flashing display for visual emergency notifications without requiring an additional speaker.

3.2 Component Procurement

- Recommended ordering two pairs of sensors to ensure backup equipment is available in case of component failure.
- Discussed the importance of backup components to prevent project delays.
- Identified additional components requiring review, including beepers, lights, and power supply components.
- Confirmed that common consumables, including resistors, wires, and boards, were already available.
- Recommended reviewing the component list with Mr. Won Sen to identify any missing equipment.

3.3 Budget Review

- Reviewed the estimated project expenditure against the discussed budget limit of $2,700.
- Confirmed during the meeting that the estimated project cost remained below the stated budget.
- Discussed the possibility of purchasing additional components if required.
- Recommended completing the component review before finalizing procurement.

3.4 Presentation and Future Development

- Discussed the final presentation scheduled for late November.
- Dr. Jim Ji expressed his intention to attend the final presentation.
- Received positive feedback regarding the team's first presentation.
- Encouraged further investigation into existing technologies and intellectual property opportunities.
- Discussed potential ministry involvement and opportunities to continue developing the project after graduation.

4. Key Outcomes and Recommendations

- Ensure backup radar sensors are available to minimize procurement-related risks.
- Review all hardware and power supply requirements before placing orders.
- Utilize existing laboratory consumables where possible.
- Maintain project expenditure within the approved budget.
- Consult Mr. Won Sen regarding component selection and procurement.
- Continue investigating related technologies and intellectual property opportunities.
- Inform Dr. Jim Ji of the final presentation arrangements.

5. Action Items

NO['	NO Action Item	Assign To	Deadline
1	Order backup sensors to minimize potential project delays.	Project Team	TBD
2	Review the component list with Mr. Won Sen and identify missing hardware.	Project Team	TBD
3	Notify Dr. Jim Ji of the final presentation date and time.	Project Team	Before final presentation

6. Next Meeting

Date: TBD

Proposed discussion topics:

- Finalized hardware component list.
- Procurement and delivery status.
- Updated project budget.
- Hardware integration progress.
- Final presentation preparation.

7. Meeting Conclusion

The meeting focused on reviewing FireGuard's hardware requirements, procurement strategy, and budget. The importance of obtaining backup sensors and ensuring the availability of all necessary components was emphasized to minimize project delays. The team was encouraged to continue investigating related technologies, finalize procurement, and prepare for the final presentation in late November.