TECHFEST 2023-2024
AtomQuest- The Why Not Challenge

Home automation is constructing automation for a domestic, mentioned as a sensible home or smart house. The problem statement involves the creation of an intelligent smart home appliance or system with specific characteristics. The objective is to develop a novel smart home technology that offers unique features and functionalities, differentiating it from existing solutions in the market.

Theme
Create an intelligent smart home appliance/ system having AT LEAST ONE of the following characteristics:
1. Motion/Occupancy detection-based intelligence (preferably using mmWave/microWave/UWB sensors)
2. Voice-based or chat-based conversational interactions that are powered by either
   a. embedded LLM or ML model in a mobile application or a microcontroller/microprocessor, or
   b. customized, fine-tuned, self-hosted LLM or ML model on Cloud
3. Use of gesture-based interactions for controlling smart appliances
4. Incremental enhancement in security for an existing home security solution, like
   a. An algorithm on an IP camera to alert the users about an intrusion attempt
   b. Additional sensors with an existing smart lock that could help alert users if the door is not latched correctly

The product or technology that you demonstrate should be NOVEL and shouldn't be a variation of what's already there in the market.

Extra points will be given depending on:
- Market readiness of your solution (a more polished solution that incorporates real-world scenarios gets more points than a rudimentary laboratory prototype)
- Cost considerations (if you create a state-of-the-art solution that no one can afford, then it's as good as not creating a solution at all)
- Demonstrable benefits over the existing method of solving the problem you are addressing (you created a new solution to solve a problem, but it doesn't match the performance of the existing benchmark, then it won't be ranked highly)

Examples of acceptable problem statements:
1. Use of a combination of mmWave and PIR sensor to detect and count humans in a room to automate HVAC systems
2. Behaviour recognition: Training a model with the interactions of users with smart appliances, and suggesting automations to users
3. Translating speech to commands for IoT devices using an LLM embedded in a mobile application, or a custom self-hosted LLM

Example of unacceptable problem statement:
1. Use of ChatGPT API in a chatbot in an app
   This is unacceptable because there is no novelty in the integration of an API of an existing LLM. If you develop a custom fine-tuned LLM specifically trained for Atomberg, then it would become acceptable.
2. Creation of a smart lock that opens with fingerprint sensor and NFC Cards
   This is unacceptable because such smart locks are already available in the market. There is no novelty. If, however, your work increases the security of fingerprint sensors (reducing False Acceptance Rate), or improves reliability of the system, that problem statement would be acceptable.

Competition Stages:
1. Abstract Submission
2. Video Prototype Submission
3. Mentoring by Atomberg Team
4. Final Presentation at TechFest in front of Atomberg jury

At both the Abstract and Video Prototype stage, there will be a shortlisting. Teams shortlisted post the video prototyping stage will be allocated mentors from Atomberg who will help them take their prototype to a more finished product/solution. These teams will then present their work at TechFest and winners will be selected.

Abstract Format:

i. Title

ii. Abstract
1. Objectives
2. Beneficiaries (For whom)
3. Value of results (Usage)

iii. Background

iv. Statement of Problem
1. Succinct definition of the problem addressed (follows from material in the background section)

v. Research
1. Present methods of tackling the problem (if any)
2. Proposed Solution
3. Alternate solutions/approaches
4. Novelty of Approach: How is/will your solution be better than the existing products that address the same problem?

vi. Technical Report
1. Description of concepts, theories and/or approach involved in the proposed Solution 2. Financial details of the proposed solution
3. Detailed technical specifications and pictorial representations (block diagrams/ flow chart)
4. Description of the flow of operations demonstrating key features and functionality
5. Performance estimate of the solution

vii. Financial Report
Estimated cost of the prototype, and the finished product; expected selling price and model.
viii. Market Report
Is there a market for your solution/product? Who will be your customers and why will they pay? Quantification here will help.
ix. Any other details: (Patent/Business plan etc.)

Evaluation Criteria:
Home Automation abstracts will be judged by a panel of experts. Following are the broad guidelines for judging:

1. Creativity and Novelty: How novel is the idea? How different is it from the current solutions available? The innovation must be ingenious and novel in its application area and should have a high potential for impacting society.
2. Originality: The innovation should not, by any means, include copied or stolen work. Such applications will be disqualified immediately.
3. Performance
4. Financial viability and Acceptance
5. Durability and Usability: Durability of the prototype/method proposed.
6. Aesthetic appeal (if applicable).
7. Error handling
8. Implementation ability: Is the solution implementable as described? Is it repeatable? Is the solution feasible for diverse and changing conditions?
9. Scalability: Is the solution scalable to a higher level, how easy is it to scale up and what are the factors affecting it?
10. Potential of Impact: How does it benefit society? The scale of the problem that it solves, the intensity of the solution and number of people catered from the solution directly and indirectly
11. Design: Has the design been taken into consideration? How optimized is the product?
12. Ergonomics (if the team decides to make a well-designed product) In case of any discrepancies, the decision of the Organizers or Judges will be final and binding on all.

Eligibility:
1. Individuals or teams from the following categories are allowed:
    a. Students/research scholars of authorized institutions (students have to show their Valid College ID)
    b. Early stage startups or up to 3 years old college pass-outs.
2. A team is allowed to have a maximum of 4 members.
3. If the participating team feels that their idea requires more participants in their team, they can forward their request, with suitable reasons, to the subject "Ideate: Team number increase request."

Registration and Submission:

The Participants have to register on the official Techfest Website and fill all the necessary details. www.techfest.org ->Competitions-> Ideates ->AtomQuest- The Why Not Challenge -> Explore More -> Register -> Fill all your details - > Now you must create/Join a team.

Abstract Submission:

Teams are required to submit one report to atomquest@techfest.org . This report should contain the idea they are looking forward to working on.

Project Report Submission:

The project report should be mailed to with the subject 'Ideate: AtomQuest- The Why Not Challenge. The report must be submitted in PDF format only mailed to atomquest@techfest.org .

Certificate Policy:

Only those teams that are shortlisted for the finals and also give a final presentation about their work during Techfest 2023-24 would be awarded an e-Certificate of Participation. The top 5 entries from this event would be provided with a Certificate of Excellence.

General Rules:

1. Every team has to register online on our website for the competition. A Team ID will be allocated to the team on registration which shall be used for future references.
2. A team can register at any point of time before <Reg deadline> and submit the final abstract and video (as mentioned in the structure).
3. The decision of the organizers or judges shall be treated as final and binding on all. Techfest has all the rights to verify the identity and accuracy of the details provided by the participants.
4. No responsibility will be held by Techfest, IIT Bombay for any late, lost or misdirected entries.
5. The idea presented by the teams should be original (not protected by means of patent/copyright/technical publication by anyone else).
6. Note that at any point of time, the latest information will be that which is on the website. However, registered participants will be informed through mail about any changes on the website.
7. All modes of official communication will be through the Techfest e-mail.

Prizes:

The prize money will be awarded to top 3 winners via NEFT and will be processed within 30 working days after receiving the prize money from sponsors. Winners have to mail the following information (immediately after the announcement of results) to akshat@techfest.org

Format Of Mail :
Subject: AtomQuest- The Why Not Challenge, Team_ID - Position

Body of mail:
1. Account Holder's Name
2. Account Number
3. Bank name and Branch name.
4. IFSC Code

Timeline:

Last date of registration	10th October 2023	Participants need to register before this date
First Project report Submission	10th October 2023	Submission of first project report along has to be submitted before this date
Final Project report and Video Submission	3rd November 2023	Submission of final project report along with video prototype has to be submitted before this date
Declaration of Result	4th November 2023	Declaration of shortlisted teams to work for final project reports
Mentorship Stage	5th November to 20th November 2023	Mentors will be allocated for the guidance of the participants
Improvisation Stage	21st November to 10th December 2023	Shortlisted participants are to improve upon their model and prepare a presentation for the final round
Final Presentation & Video Submission	11th December 2023	Participants have to submit the final video of the prototype and presentation to be displayed during the the festival before this date
Presentation Stage	27th-29th December 2023	Final presentation along with a demonstration of the working prototype
Exhibition	27th-29th December 2023	Techfest would give an opportunity to teams selected by judges to exhibit their projects