



**TAL  
TECH**

# **3D PRINTABLE WIDE FILTER SMART RESPIRATORY MASK**

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## AIM OF THE PROJECT

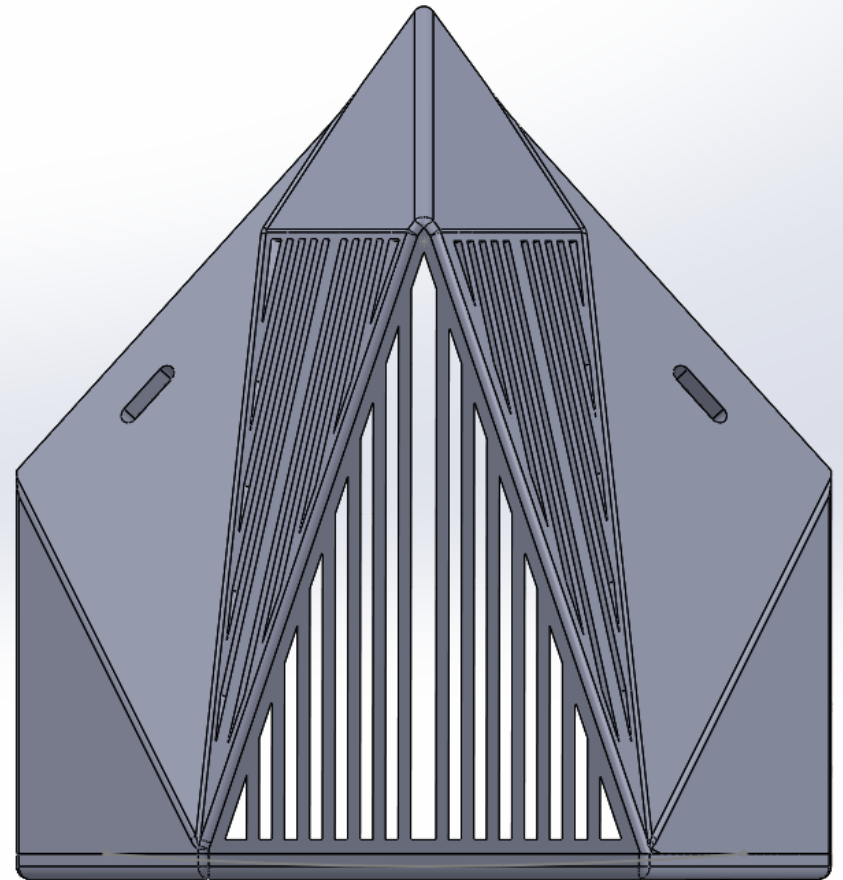
- Create an easily printable and reusable mask.
- Being able to tell the temperature inside the mask.
- To cut the long-term costs for institutes (medical, industrial, engineering)
- Especially to help medical professionals with providing much needed masks.

## SOLUTIONS TO PROBLEMS

- Contant cost and single use masks.
  - Reusable, and easily repairable product.
- Masks only having single type of filtering capacity.
  - By having rechargeable filter, one can adjust the density of the material hence, changing the filtering capacity.
- Heat buildup in the mask causing sweating on the skin.
  - Having a big and wide filter area allows for more circulation inside the mask, reducing the heat build-up in the mask.
- Size not fitting for certain people.
  - Wide and spacious design allows for single size fitting. And the size can be easily adjusted.

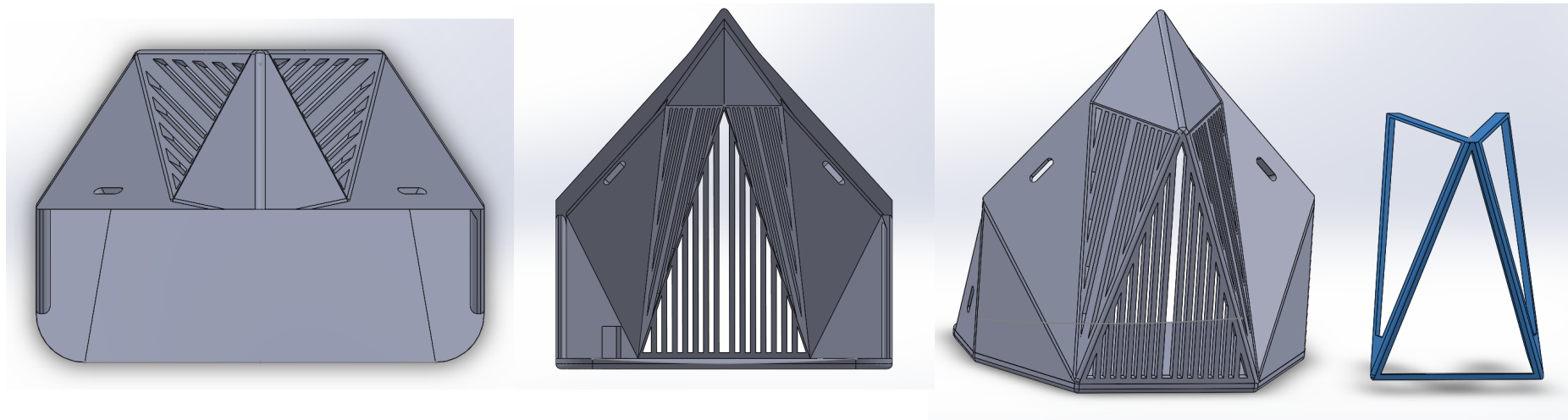
## THE DESIGN

- The design has a more geometrical character to it in purpose to maximize the efficiency of usage of space.
- The 3 big faces with openings give the wearer plenty of air and ventilation throughout the whole mask
- The mask will fit the face with a rubber or a sponge fitting ensuring complete seal



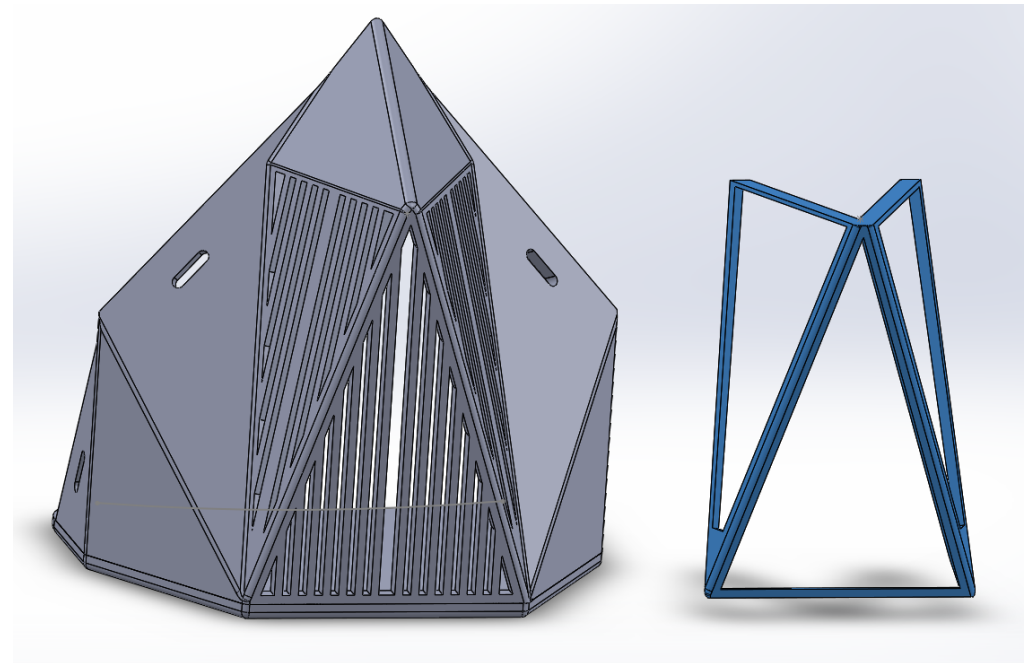
# THE DESIGN

Some more design pictures...



## THE FILTER

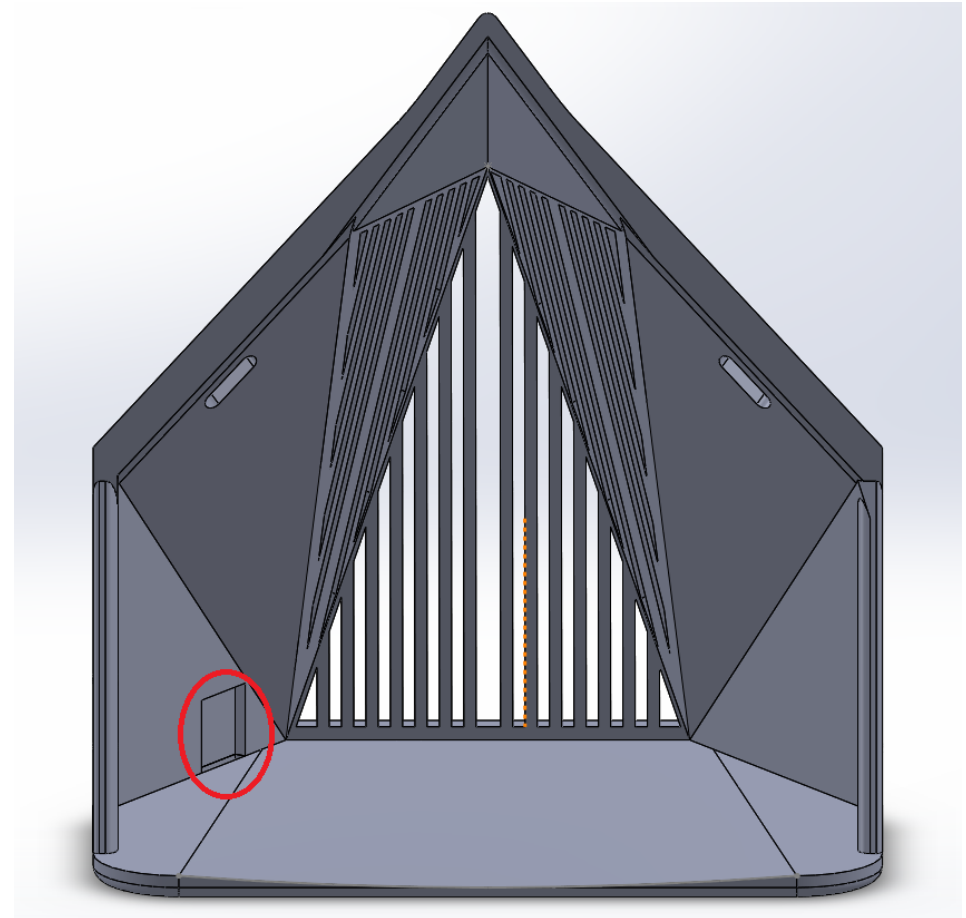
- As can be seen in the picture, the mask consists of 2 pieces 1.the mask itself and 2. The inner filter frame.
- This frame will fit in the mask on the inner side to keep the filter material fitted in place between it and the mask.
- The filter material can practically be anything from 3-4 layered cloth to makeup cottons or the specialized filtering materials.





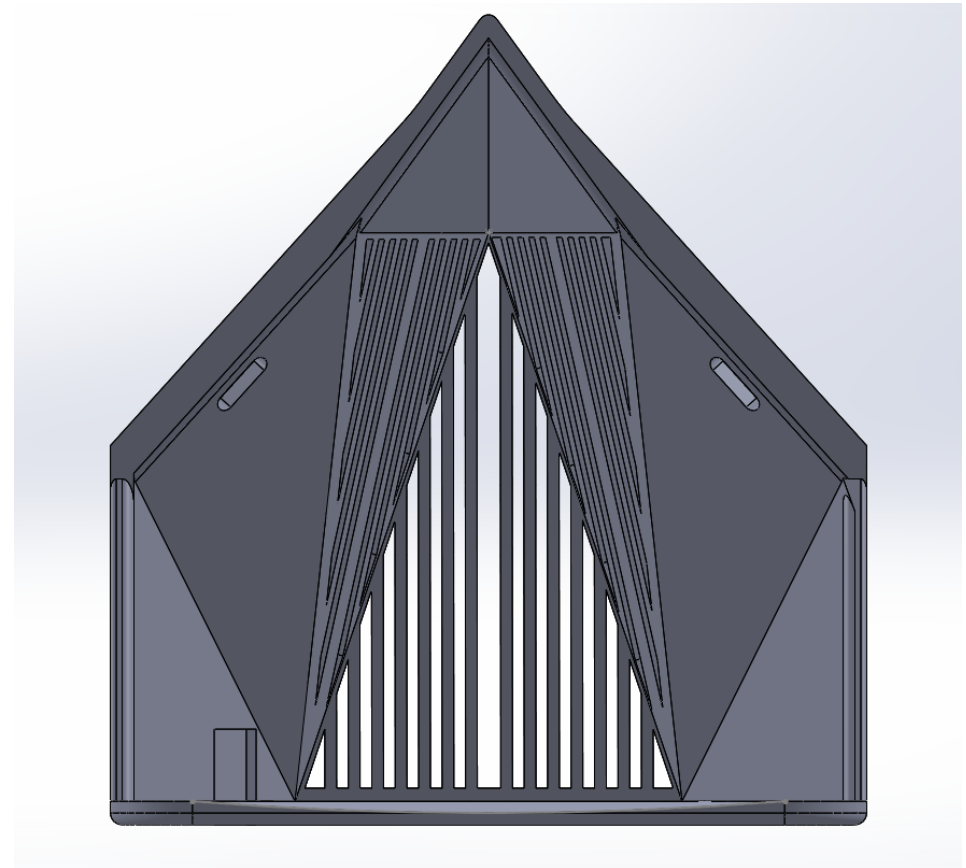
## THE SENSOR

- The sensor will be fitted in a small socket shown in the red circle.
- The electronics for it will be under the bottom part of the mask ensuring none of it will be in the way while wearing the mask
- The will be of medical grade and will not require any contact to the skin so it will only measure the inner temperature of the mask



## THE FIT

- The edges of the mask making contact with the face will have a rubber or a spongeous fit
- This will ensure a more comfortable fit by preventing hard metal from pushing against the skin
- The soft fit gives a better hermetic seal making sure that there are no openings in left making it more safe to wear





## POSSIBLE FUTURE IMPROVEMENTS

- One of the planned future additions would be to add a secondary contactless skin thermometer to measure fever
- Second one would be to add saturation sensors to the mask for the more advanced uses of the mask with special filters
- Make an app for all the sensory readings and eventually to control them through the app to give warnings after a certain threshold is reached

*Thank you!*

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