**GAMUTAN, Adrian C.**

**TMG – Part 2: Design Concepts and Alternatives**

**Project Description**

The project focuses primarily on tackling the main problem of the current heatwave we have in our beloved tropical country. While other countries are enjoying beautiful aurora skies, we are suffering from the worryingly high temperatures and heat causing people to easily sweat and get uncomfortable while going on through their day.

With the problem in mind, a device concept was made in which it would be a wearable cap with cooling features that either (1) Uses the materials of a small hand fan, (2) Uses refrigerating methods in a smaller scale, or (3) Utilizes small compact fans like in computers.

For the part 2 of the project, some design concepts will be shown in order to display the general idea of the final product of the device.

**Key Requirements:**

**Comfortable wearable cap design** – The design should still suffice as a typical cap that anyone can wear.

**Cooling features**

1. **Cooling** – The key feature of the design which will provide cool air for the user
2. **Battery** – The supporting feature for determining the device’s capabilities in battery life and cooling strength

**Design Space:**

In designing the device, a lot of the features must be balanced. It is important to remember that a user is most likely going to be wearing this throughout the day, in which it would be burdening if the device is very heavy. This can prove to be hard as we would need to find the perfect mix of cooling, good looks and efficiency in battery life.

**Design Concepts:**

**A drawing of a hat

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For the concepts, I have decided to use small, powered fans for the cooling feature of the device, in which the choices are to be to embed it on the main body of the cap on its sides, or on the brim facing the user’s face. A possible choice would also be to merge the two concepts and add three fans overall, which would be a different problem regarding what battery would be sufficient to power the three while staying light and non-protruding.

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**Design Alternatives**

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The alternate designs of the device are taken from an existing idea for a cooling shirt, where water is used and is flowing in a pipe throughout the cap which provides the cooling feature, but just as the shirt is not that effective at cooling, it would also not be sufficient for a cap. The second design is like the choices for the device, but it is not as good looking as the others as the fans protrude too much, and the placement makes it annoying to hear as it is close to the ears.

References:

Water cooling shirt: https://www.youtube.com/watch?app=desktop&v=cAddlreCIFc