**Project Description:**

The purpose of this project is to design and implement an outdoor misting system to cool down the free space of Abu Dhabi University campus especially in summer conditions. This project helps the students/employees of ADU feel cool and comfortable when they are outside by minimizing the temperature difference between the indoor and outdoor conditions. The proposed system will be totally powered by solar energy.

**Requirements *(****describe what we want to happen)*

* Design an outdoor misting system to cool down the free space of Abu Dhabi University campus especially in Summer conditions.
* Implement and test this system on a small-scale prototype.
* Use the prototype testing results to study the feasibility of a real-world campus-wide system.
* Implement a proof of concept small part of the real-world system for a designated area and validate your design.

**Design Constraints *(****describe real-world limits around what we want to happen)*

* Prototype:
* Cost: a maximum of AED 3000.
* Weight: a maximum of 7 kg.
* Size: a maximum of 120 cm x 80 cm.
* Materials: renewable/recyclable material only.
* Aesthetic: well-polished and interactive design with no flying wires, breadboards, or lose components.
* Usability: the prototype will be easy to use with documentation, easy to handle, and portable to be presented to potential investors/clients.
* Sustainability: must harvest all of its solar energy needs.
* Maintainability: must contain enough water to function for 3 hours.
* Functionality:
  + It must have a temperature-controlled indoor area, outdoor area under the system influence, and another area outside of the system influence.
  + It must have a button to start the system and stop it.
  + It must have a display of all three temperatures (indoors, cooled outdoors, and uncooled outdoors).
  + It must have a sub-system for power management that balance the battery charge level and cooling control to achieve maximum cooling.
* Real-world Design:
* Cost: a maximum of AED 300,000 capital investment.
* Size: covers all entrances of Abu Dhabi University – Abu Dhabi Campus with an effect area of 2-3 meters.
* Aesthetic: must fit with the architecture of the building and the pipes and the sprinkled water should not affect the building structure.
* Usability: easy to control and monitor from a centralized control panel with BSF.
* Sustainability: must harvest all of its solar energy needs and use only recyclable materials.
* Maintainability: must contain enough water to function for a week before replacement.