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Smart Umbrella: A Way to Beautify Future Smart Cities

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Abstract

The population of world increasing day by day and due to this the demand of urban cities also becoming high in smarter way as compare to it before. As we are living in 4th generation of industrial revolution which caters human need in smarter way. It branded by means of a combination of knowledges that is clouding the streaks amongst the somatic, arithmetical, and biotic compasses, communally denoted to as cyber-physical structures. Regions of world having tropical weather condition facing rains usually after every 2 hours required umbrella as mandatory tool/ equipment. The need of future cities are now of smart umbrella which can open up by its own using sensory signal during rain on large opening spaces of cities such as car parking's, pedestrians, outside buildings, restaurant and also for individual need with option of connectivity with Wi-Fi, USB and Music App.for enjoying rain along beautification factors for cities. In this research paper author suggests smart umbrella for smart future cities in terms of opening up itself using sensory signals at the time of rain over car parking, canopies, large open spaces and also able to closed itself as rain goes down. These phenomena also help in getting enough sunlight after rain which helps in evaporation process too. Not only technological aspect, aesthetic aspect will also be added by using specific themes, colors, patters with respect to demand of space which adds beautification of cities in terms of added values or created ambiance for specific purpose .Similarly author also going to suggest a smart umbrella for individuals with design patters, colors which help them to connect with Wi-Fi, USB, Music App easily so that it can able user to enjoy the rain.

Keywords: Smart Umbrella, Future Cities, Design

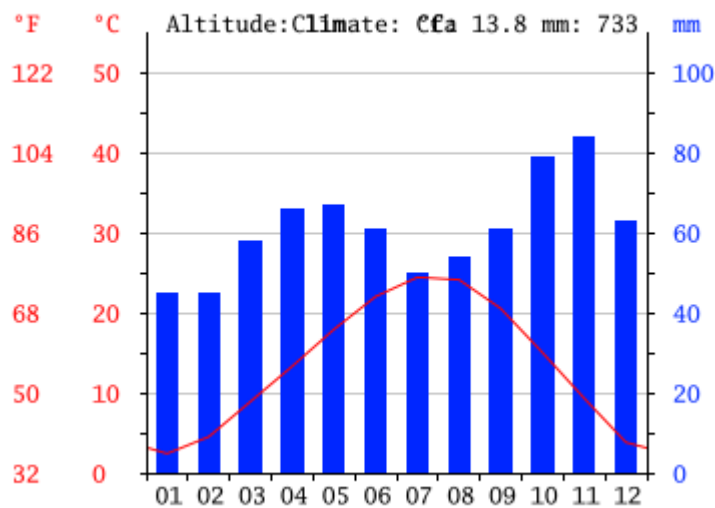
Introduction

Enlarged urbanization is sensation knowledgeable cutting-edge utmost of the emerging and industrialized capitals about the sphere. The rustic inhabitants in the sphere are nowadays nearby to

3.4 billion and be situated likely to the deterioration around 3.2 billion in 2050 which is discussed in United Nation Report of 2015. Rural territories have to face desertification, particularly since the industrial revolution when people started to move in populated urban areas due to economic activities. This delinquent declines our eminence of lifecycle and partakes customary marvelous responsiveness through metropolitan developers, countryside draftspersons and originators in the current ages. The issues that donate to metropolitan architecture be situated in constructions, infrastructures, roads, quantity considered in plant life, exposed places and etc., nevertheless modern investigates partakes confirmed that in attendance noteworthy quantity of influence and impact through the streets side parking's, outdoor dining areas which also adds their part in the development of urban areas. In the concentration to provide lodgings the rising inhabitants, metropolises are reckless increasing consequential in considerable upsurges of thoroughfare and their parking lots. Current study on exploration of numerous categories of passageway assemblies partakes exposed that the involvement of the thoroughfare passageway or shades gives also significant impact in the beautification of cities. In this age of 5th industrial revolution there is need to overcome concrete look of big future cities by providing beautiful umbrellas for protecting areas against heavy rain and able to ultimate open up during rain time specially in the region of far east countries and closes down itself where sunlight and rain occurs parallel. In order to save time, energy smart umbrella is solution of large car parking lots, covered pedestrians, outdoor dining areas which not only works efficiently by its self but also adds value on the side of beautification of the cities. Similarly umbrella for individuals must be able to smart in performance by adding features of connectivity with Wi-Fi, having panel inside helps in weather forecasting with nice play station in it. This help individuals in enjoying weather as well.

Metropolitan sceneries of warm moist climate areas particularly practices great strength sun heat by cumulative high temperature expansion and also cause high rate of evaporation that result rain. Metropolitan macroclimate is significantly stimulus through countless metropolitan scenery issues considered as the structure of metropolitan textiles, organic and in-organic exteriors, metropolitan ornamentation, road design, planner intricacy, warm air resources and humanoid doings. Modern studies partake showed thru city/urban the configuration of metropolitan scenery partakes pretentious the atmospheric situation of metropolitan troposphere. In order to save them smart umbrella again needed on need base for individuals as well along on commercial side.

The rain in Asia is noteworthy, thru drizzle also throughout the thirstiest time. The Köppen-Geiger weather cataloguing is Cfa. The usual yearly hotness is 13.8 °C in Asia. In a time of year, the usual precipitation is 733 mm.



Source: www.climate-data.org

Concepts of Smart Cities

Nearly on no account universally accepted description, because it means dissimilar stuffs to diverse individuals in diverse portions of the biosphere. Aimed at considered, smart cities are ultra-modern urban areas that address the requirements of businesses, organizations and especially peoples. The idea of smart cities not only considered in meaning of that by automation of daily routine works aiding distinct individuals, road traffic schemes, nevertheless in means of that permit individuals to check, comprehend, design the urban areas to progress: (i) sustainability, (ii) competence, (iii) superiority of life expectancy for its peoples in actual period. Smart city interconnects different operators and services to improve functionalities. We can achieve it through the application of ICT in order to retrieve, process and exchange data. It is planned, created and sustained thru consuming extremely progressive combined expertise that comprise instruments, microchip technology and webs that are connected by means of electronic/computer schemes encompassed of databanks, tracing and decision building procedures.

Smart cities focused on enhancing urban life regarding six dimensions: mobility, governance, people, living, economy and environment (Giffinger et al., 2007). By incorporating any one of the following key features:

- Setups of sensors
- Cloud computing
- Networks of digital communications
- Machine-to-Machine (M2M) solutions
- Real-time Analytics
- Big Data:
- Artificial Intelligence
- Blockchain (Nektaria Kaloudi ,2018)

In order to save the buildings, humans from rain several types of rain shelter are available in the market with different materials like nylon, polyester, parachute material, canvas etc.

Utilization of umbrella as in form of Resort Tent Umbrella, Traditional Tent, Dining Tent, Camping Tent Umbrella and Sleeping Bag, Display Tent Umbrella, Exhibition Tent and outdoor parking Umbrella etc.



Source: Online



Picture 1: Types of umbrellas for shelter on commercial scale

Let's go into the side of Individual Umbrellas



Source: Online

Sensors and Motors

There are different types of water drop sensors available in the market with different maker names. From them one sensor is called RG-11 which actually having price of 4 to 6 US\$. The RG-11 recoils rays of light inside the lens. Once droplets succeeds the external seeming, it permits more or less of the rays to outflow. The RG-11 perceives the alteration in ray strength, and regulates the magnitude of the rain droplet that produced the alteration. The refined electrical system and Alphanumeric Indication Dispensation perceive minute rain droplets, and cast-off the possessions of ambient sunlit turbulences. The RG-11 perceives the external situation, produced thru dust, pollutants, elderly, and extra issues. It appropriately recompenses the information, manufacture the expedient almost impermeable to ecological features.

Refined software collects statistics beginning from discrete rain/drops in addition to outfits an appropriate regulator plan aimed at the designated means. The scheme be able to sense discrete droplets of underneath part of a millimetre. The tipping vessel impersonation process be able to record gatherings of only one ten-thousands of an inch– a hundred whiles supplementary delicate than a emblematic tipping vessel. The RG-11 scrounges knowledge that was industrialized in excess of numerous existences for self-propelled rain detecting windshield wiper panels. (www.Hydron.pvt.Ltd)

However don't apprehension around the intricacy of the Rain Measurement. Consider of it by way of a serviceable block that summarizes the rain detecting job designed for requirements dependably, little repairs, and at a squat price.



The signal will be given on observing any individual rain drop. Usually, the aforementioned will generates extended beats (in multiples of 200 mS) for bigger droplets. Uncertainty established to manifold beats on each droplet (SW 3 ON), individually noticed droplet will produce single or further 100 mS beats, subject on droplet proportions.



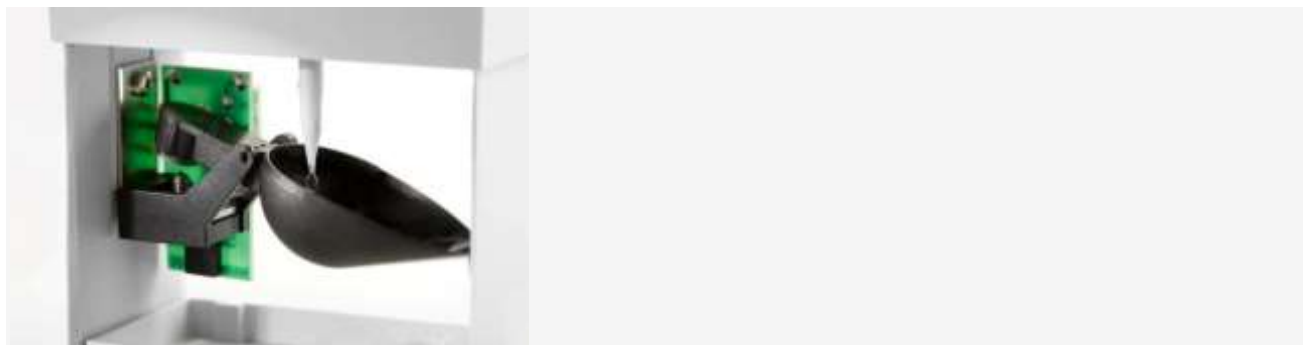
Source: www.Hydeon Cooperation Ltd.

Product facts

Package Dimensions	7 x 3.9 x 3.2 measured in inches
Article Mass	7.3 measured in ounces
Delivery Mass	7.3 measured in ounces

Another type of rain sensor called Rain-o-matic.

RAIN-O-MATIC tiny registered single spoon tipping vessel be present as unique, light weight reliable, accurate readings, proper rain droplets measuring gauge sensor available in the market and using on various end uses for the purpose of measuring rain. The Bucket attached to this sensor is manufacture with the material which is flippant substantial and consequently marques sort of dirt, dust contamination sticky free therefore effortlessly on the spoon over and get the most out of water discharge.



Source: www.Pronamic Ltd.

Rain gauge/Tipping Spoon

It calculates the rain fall by means of a funnel (about 40 cm²), able to tips the water dejected keen on the solitary self-emptying tilting spoon, detained fashionable habitation thru a firm strong magnetic body.

The magnetic body continuously applies fair abundant stiffness to permit the calculating spoon in the direction of unfilled cutting-edge solitary rapid drive (not more than 299 ms) and at that moment coming back to its usual location, prepared in the direction of on one occasion yet again to assemble rain fall. It explains or meant as the poker chip mass every time remains the identical contradictory in the direction of additional unoriginal two spoons tipping vessel rain instruments.

Motor and Opening/Closing Device

For automatic opening and closing of shelter/umbrella for outdoor areas Researcher took technical expertise of a company named Techno-one based in Lahore city of Pakistan that able to construct umbrella/shelter industrial scale with automatic motor

Automatic Car Parking Shed

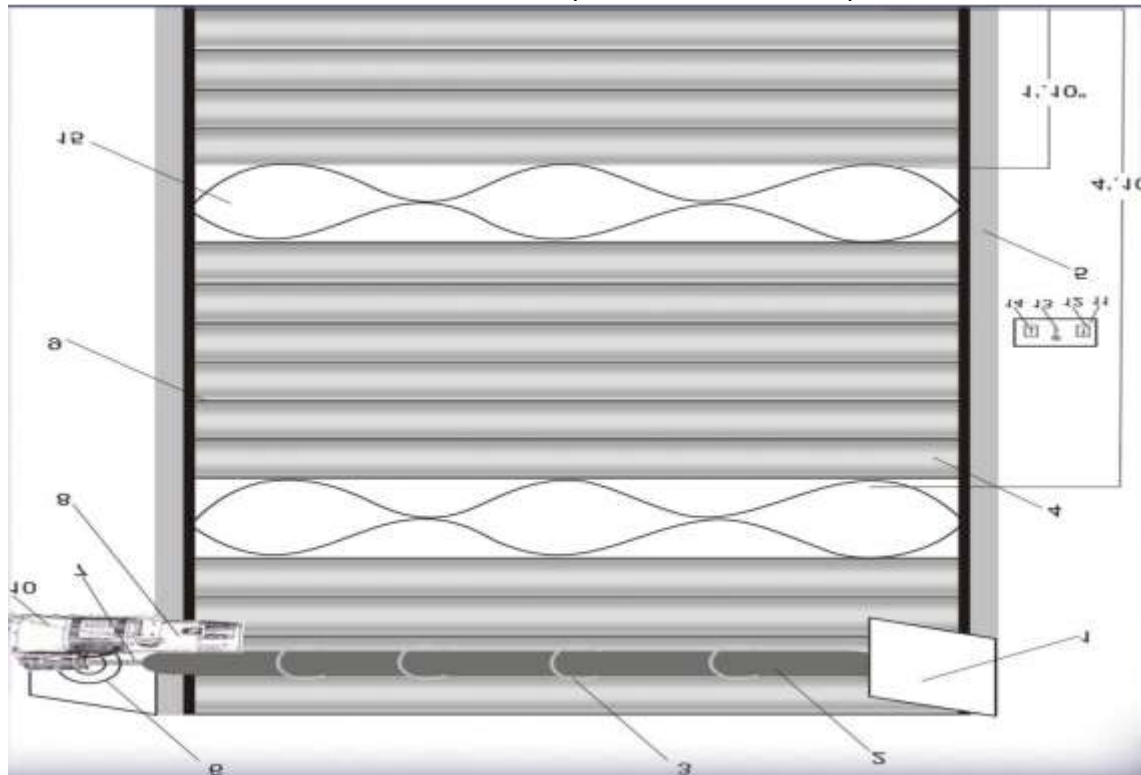


Source: <http://www.technoone.pk/>

Motor to operate shed automatically: TAU T-ONE-8BR Sliding Gate, shutter, shed Operator



Source: <http://www.technoone.pk/>



Physical Minutiae

- Adjacent plate = Size 1' x 1' feet [S.W.G.14]
- Rolling pipe = Size 2" x length? [S.W.G.14]
- Rolling ring = Size dia 8" [S.W.G.14]
- Rolling MS sheet = size [S.W.G.24]
- Rolling guide = size
- Universal bearings = size
- Bearing shaft = size 1" dia
- Gear motor
- Rolling sheet joint = Size 3" round
- Manual operating chain

- Operating board = Btchino made in Italy
- Up push = Btchino made in Italy
- Lock Key = Btchino made in Italy
- Down push = Btchino made in Italy
- Bending iron rod = 3" x 5" x 4"

The exterior of the electrically powered motor form take on UV light resistant substantial which partakes outer holding in repelling somewhat hard-hitting environs.

The aforementioned not progresses inhabited environs, and the anti-theft clutch scheme be able to button the procedure to labor-intensive governor effortlessly at time of electricity shut down. It's on/off signal link with light emitting signal of rain sensor.

Sampling ...Concept Realization

In this research article two concepts of smart umbrella are going to be given one is open up and close up by sensing water molecules in form of rain and on vanishing water molecule it closes again for getting sunlight. And second one for individuals which unable to connect with wifi, having USB port, or interference smart panel for music and able to check more weather forecast. This smart gadget is powered by battery either lithium or solar.

Material PVC, Polyester Parachute

Theme: floral

Size of panel:

- 321dp: a classic phone display (230x350 ldpi, 320x480 mdpi, 480x800 hdpi, etc).





Conclusion

The idea of smart umbrella for future cities was aimed to create ambiance in the city by applying design-based umbrella. The automatic sensor-controlled umbrella for large out door spaces can be made in any shape or any size. Similarly, smart Umbrella for individual able to enjoy the rain with latest songs/music and weather updates. Hence this idea helps to construct cities in new and inspiring way. The above idea of developing smart umbrella gives theoretical contribution in terms of right choices of electronic component with respect to technology with proper options of senses for

outdoor umbrellas and personal umbrella for upcoming researchers and students. Above all this formulation of paper gives idea of outdoor beautification in the context of car porches, canopies and shelters with respect to Design context as well.

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