Solar Park with Photovoltaic 3D-printed Trees: Technology Allies with Nature

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The future of our planet is balancing on a thread: combating climate change. Natural substances and fossil fuels are not replenished at the speed at which they are consumed, yet there are ever-growing energy needs. The need to exploit clean solar energy is great, as according to a research only 0.01% of the total energy globally comes from solar energy. Striving towards renewable energies is demanded. Hence, we propose a forest with 3D-printed trees, whose leaves will harvest solar energy. A prototype has already been created and tested. We provide three crucial innovations. A gyroscopic mechanism will adjust accordingly the leaves' position and inclination to be constantly facing the sun, whose rays should be perpendicular to the photovoltaic's surface. As shown from the formula ?=I? cos?, where ?? is the maximum intensity of the sun's radiation and cos? is the cosine of the angle formed by the sun's ray with the perpendicular to the surface, when the angle ? is zero, the intensity is maximized since cos0 = 1. Thus, this mechanism improves efficiency. Also, an automated process will control the trees' heights, so that none is shaded to captivate maximum energy. Finally, each tree will rotate around itself at a constant rate depending on the heat, since with excessive temperature rise a decrease in the efficiency of the panels occurs. Our leaves utilize as much solar energy as possible avoiding the aforementioned phenomenon. These innovations, when implemented, can become pillars for a green future.

Awards Won:
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: On-line Mawhiba Universal Enrichment Program
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: Award of $500
Edison International : Second Award of $1,250
Ricoh USA, Inc: Ricoh Sustainable Development Award of $10,000