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Foresting The Urban Environment Through Living Walls Autonomously Maintained By Symbiotic Autonomous Systems

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Extended Abstract

The impact of climate change has more evidently been displayed in the recent century than in the whole of humanity's recorded history combined and is pushing our planet towards sixth mass extinction [1]. While the world population is estimated to increase to 10 billion by 2050 [2], the current consumption of resources is not sustainable without an immediate implementation of a circular economy. Instead of deforesting urban space for an increasing population, we could create an environment where humans live with nature via the use of intelligent symbiotic autonomous systems and swam technology. The use of living walls has proven to offer many benefits to densely populated areas thereby replacing air-conditioning and forbiding the use of electricity produced by fossil fuels [3]. However, one of the challenges with living walls is that it has to be regularly maintained. The manpower utilisation is not only inefficient but is costly and unsustainable in the long term. This could be resolved by designing a symbiotic autonomous system which captures instant weather conditions through multiple sensors and meteorological data streaming from the servers. Furthermore, the systems is embedded with self-sustaining ability of allocating rainwater for the living walls during the dry seasons. Each system must also have the ability to tap into the localised power generated from solar energy. The systems will process the mobility along a structure that holds the living wall with minimal obstructions. Another distinctive feature is the ability to manipulate the environment by trimming and ensuring the living wall does not overpopulate its intended areas. The last but most important feature is to adopt the behaviour of a caretaker. This will then utilise all the available peripherals to continuously monitor and learn the growth pattern of its living walls through the use of artificial intelligence by tapping from the cloud based server. After which, the use of robotics and automation is employed. However, in this proposal, the design of such systems contributes to their uniqueness through the integration and application of an intelligent symbiotic autonomous system (SAS) on plant science and isolated power system from renewable energy. This enables a modular system that encapsulates a fully functional and eco-friendly design that would not leave any carbon footprints and hopefully helps to reverse the effects of climate change.

References

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