

# Solar Powered Swimming Pool with Smart Lighting System

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## Abstract

Solar Energy and Smart Technology are only a few of the constantly desired features of consumers as they seek personal improvement within their different contexts, whether it be for personal and general gain. The full use of these improvements continues to increase within engineering disciplines and other fields. This project is an asset to the construction and housing industry within Jamaica and other countries desiring to take advantage of solar energy. A solar powered semi-inground swimming pool is designed with a unique smart lighting system for energy savings, aesthetics, and customer satisfaction. The project integrated various skill and considerations across civil, electrical, industrial, and mechanical engineering disciplines for the fully operational and uniquely designed pool. This pool was designed as a commercial pool with features that facilitate the needs of different genders, ages, and persons with special needs. The entire workspace area includes a pool system, an electrical power room, pumping station, changing room and bathroom facilities and other miscellaneous considerations.

## Keywords

Solar Energy, Swimming Pool, Smart Lighting and Pool Design

## Biographies

**Shavae Scale** is a final year engineering student in the School of Engineering at the University of Technology, Jamaica pursuing a Bachelor of Engineering in Civil Engineering. She earned an Associate in Engineering Technology from the Montego Bay Community College where she also received the Giuseppe Maffessanti Scholarship Award. Throughout her tenure at UTech, Ja., she served on the Students' Union as the Resident Students' Representative as well as she was highly involved in numerous students' union initiatives and projects. Her final year major project was 'The Redevelopment of the Hope Botanical Gardens and Zoo into a World Class Amusement Park'. Her research interests include design, entrepreneurship, architecture, visual arts, graphics, and media communication.

**Adrian Francis** is a Electrical Engineering student pursuing his B. Eng. in Electrical Engineering at the University of Technology, Jamaica. He has received the Y.P. Seaton and Associates Award for Best Electrical Diploma Senior Project. His major project was titled Electric Pole Line Infrastructure Fault Detection using Image Processing and his research interest include Power Generation Systems.

**Rohando Malcolm** is a final semester student, of the University of Technology Jamaica, pursuing a B. Eng. in Mechanical Engineering. His main interests are in aerospace as well as automotive engineering and sees himself in a career in either of the two. He recently completed his Major Project titled "Feasibility Study of the Implementation of a 3kW Wind Turbine on the UTech, Ja., Papine campus". He intends to further his education by completing a master's degree in Mechanical Engineering upon completion of his current program.

**Lamanja Ellis** is an Electrical and Computer Engineering student pursuing her B. Eng. in Electrical Engineering at the University of Technology, Jamaica. With excellent communication skills attained from working in groups for academic projects she has obtained professional experience as a Filing Clerk (2017) at The Ministry of Education (Jamaica) which has the responsibility for collecting and organizing company data. Additionally, she has experience as a Ride Associate (2018) at Carowinds, North Carolina which provides the best customer service to riders as well as to observe park safety protocols. Ms. Ellis is no stranger to volunteerism with experience as an Assistant Cub Scout leader at Marlie Mount where she has supervised the cub scouts in activities and ensured safety protocols are

followed. A self-taught linguist in Basic Korean and Spanish to improve cultural awareness and remove communication barriers. Her study bloomed with her final year project construction of a Robotic Arm of three axes using three-Dimensional Printing.

**Kemar Green** is a Mechanical Engineering student pursuing his B. Eng. in Mechanical Engineering at the University of Technology, Jamaica.

**Junior A. Bennett** is an Industrial Engineering Lecturer and Leader of the UTech Ja Productivity Research Group at the University of Technology, Jamaica. He earned a Bachelor of Education in Industrial Technology – Electrical from the University of Technology, Jamaica, and a Master of Science in Manufacturing Engineering Systems from the Western Illinois University. He is the First Jamaican to be certified as a Manufacturing Engineer (CMfgE) by the Society of Manufacturing Engineers (SME). He is credited for the establishment of the UTech Ja Society of Manufacturing Engineering Student Chapter S430 and was former Faculty Advisor.

He is a former council member and corporate member of the Jamaica Institution of Engineers (JIE) and represents JIE on the National Commission of Science and Technology. He is a Registered Industrial Engineer with the Professional Engineering Registration Board and member of IEOM, SME and IISE. His research interests are productivity improvement, operations research, manufacturing, Industry 4.0 and quality control management.

**Glendon Lewis** is a Civil Engineering Lecturer at the University of Technology, Jamaica. He has a M.Sc. in Civil Engineering from Norwich University in the USA, B.Sc. Diploma in Mechanical Engineering from the University of Technology Jamaica, and Diploma in Management Studies from the Jamaica Institute of Management. He has been involved in Mechanical and Civil Engineering works for over twenty-six (26) years and provided design consultancy and have managed projects in construction of service stations and convenient stores, commercial building, dwelling houses, design and installation of process, wastewater, sewage and potable pipeline.