# "Detect Usage Pattern of devices in Microgrid Environment"

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# Dissertation proposal

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- This is the proposal for the ME-Dissertation work in the Company named GridScape Solutions is a leading smart energy solutions company that specializes in developing and deploying innovative, standards-compliant products and solutions for renewable Microgrid and EV charging systems. In this Industrial Define Project is focuses on area of **usage pattern devices** in Microgrid system for the following problem

## PROBLEM STATEMENT

- Modern life has grown to be extremely dependent on **Electric Power**. As the world's services increasing in consumption of energy has highlighted energy crises and environment threats. Various Countries are planning and developing strategies and for this the **Microgrids** has received a lot of buzz the recent years and giving incentives to public for the promotion and development of **sustainable energy** project like **solar roof**, low-usage LED bulb, and for providing them with energy efficient device we have to detect the **power usage pattern** of that devices with the help of some **algorithms** which used to minimize the **energy wastage** and **annual electricity cost.**

- Too carried out the **usage pattern** of each an every electrical devices in microgrid environment is more important in optimizing the cost and Wastage .

- It is estimated that around **35%** of the energy supplied to the devices are **wasted**. To overcome this problem one of the solution is to study above its "**usage pattern**" of the device used in Microgrid Environment because Microgrid is consider as one of the power full tool to minimize energy waste.

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## PROPOSED SOLUTION

- **Smart microgrids** are a possibility to reduce complexity by performing local usage optimization of devices used in consumption of energy.
- A micrgrid consists of four main units:-
  - production unit
  - unit of storage
  - control system(HVAC)
  - consumers
- Operating and Controlling a smart grid involves optimization for using locally generated energy and to provide feedback to the user when and how to used devices.
- Today we have a technologies which enable us to transfer data far distance and we have much faster computing power that can sent a feedback to the device where to operate.
- So for using that data we need to have an algorithms that identify electrical devices in **real time** using **intelligent techniques** through **data analysis** that help in overcome above problems which directly benefits us to **reduce wastage** of energy and make end user to use more **renewable** and **Non-conventional resources.**
- This process is initiated by collecting information related to power usage of electrical devices which is used in microgrid environment.

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## PROPOSED METHOD FOR SOLUTION

- Machine Learning
  - K-means
  - Neural network
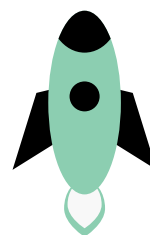  - Means-swift
  - Fuzzy logic
- Artificial Intelligence

## MILESTONES

Detailed Study and Planning

Prototyping and User-Testing

Presenting/Launch

## PROJECT PROCESS

**01** **CONCEPTS**
Undestanding the Concept

**03** **FINALISE**
Design finalisation and completion

**02** **ALGORITHUM**
Apply the best method

**04** **ASSESS**
Design to be ready for the used.

# RESOURCES & REFERENCES

1. **"Real Time Identification of Electrical Devices through Power Consumption Pattern Detection".**
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3. ELSEVIER:-"**Understanding usage patterns of electric kettle and energy saving potential"** (D.M. Murray ⇑, J. Liao, L. Stankovic, V. Stankovic) Department of Electronic and Electrical Engineering, University of Strathclyde, 204 George St., Glasgow, United Kingdom(2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).
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5. ELSEVIER:-"R**esidential energy consumption patterns and the overall housing energy requirements of urban and rural households in Finland". (**2014 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/3.0/)).
6. **"Classification of Household Devices by Electricity Usage Profiles". (**Jason Lines1, Anthony Bagnall1, Patrick Caiger-Smith2, and Simon Anderson2,{paddy, simon}@greenenergyoptions.co.uk http://www.greenenergyoptions.co.uk)