# The Energy Cost Comparison Using Mixed Integer Linear Programming and Simulated Annealing Method in Smart Home


| *Authors* | *Name* | *Last Name* | *Phone Number* | *E-Mail Adress* | *Affiliation* |
|---|---|---|---|---|---|
| *Author 1* | *Emre* | *Güler* | *05424207162* | *emre.guler@karatay.edu.tr* | *KTO Karatay Üniversitesi* |
| *Author 2* | *Ümmühan* | *Başaran Filik* | *05053869556* | *ummuhan.basaran@gmail.com* | *Eskişehir Teknik Üniversitesi* |

E-mail of Corresponding Author: emre.guler@karatay.edu.tr

- Emre GÜLER


Smart home energy scheduling problem is a significant subject in power system to avoid extra expenditure. In this work, the scheduling problem is realized using mixed integer linear (MILP) programming and simulated annealing (SA) method. MILP is one of the integer optimization method and SA is a strong technique for solving hard combinatorial optimization problems. Various types of electricity tariff is applied from country to country. In Turkey, one term and three term tariffs (electricity prices are divided into three parts; off-peak hours, mid-peak hours on-peak hours) are used. In this study, the three term tariffs are selected for the scheduling problem. There are some constraints about working principle of appliances which have own working range in smart home energy management system. It is defined that how many hours per day each device will run. Also it is defined that which hours are possible to run appliances in smart home. The advantages and disadvantages of the methods compared to each other are discussed.

***Keywords:MILP, Simulated Annealing, Smart Home, Energy Scheduling***