Optimization of energy consumption in land leveling using GIS, genetic and pso (particle swarm optimization) algorithms

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1- One of the most important steps to prepare soil is land leveling. Land leveling with machines require considerable energy. To increase the accuracy of the calculations, the point height collected from mapping (50 m × 50 m) insert into the GIS environment. rest of the unknown coordinates were obtained using interpolation and a triangular network model (TIN) was used to determine the exact volume of earthworks. In all methods, the equation of the leveling plate, excavation and embankment volumes and maps of land surface after leveling, separation of excavation and embankment and the energy consumption including power of the machine, fuel and manpower were calculated then different methods were compared. The results showed that the ratio of excavation to embankment based on the methods of minimum least squares, genetic algorithm, linear algorithm for optimizing of the particle motions, the particle motion curve algorithm are equal to 1.26, 1.14, 1.12, and 1.16, respectively. On the other hands, the results showed that the method of the particle motion curve algorithm has been shown a 45% reduction in energy consumption in the leveling operation relative to the method of minimum least squares. The genetic algorithm can reduce energy consumption by 42 percent. Between the models used in the method of genetic algorithm, model No. 1 has been estimated that the largest portion of energy consumption is relevant to the fuel (up to 71.83 percent) and the lowest portion of energy consumption is relevant to the manpower (up to 0.38 percent). Therefore, the present study recommends the model of plate-curve genetic algorithm as the best model.

2- **Recent Publications**

3- Mirzaei, F., Delavar, M. R., Alzoubi,I&Nadjar Arrabi, B. (2017).Modeling and prefect environmental indicators for land leveling, using ANFIS and regression. International Journal of Energy Sector Management. 12(4)

4- alzoubi,I., sheikh davodi,M.J., bahrami,H., afzalii,M., (2013).Effect of tillage method, planter type and its travel speed on quality indices in maize seeding. Journal of Researches in Mechanics of Agricultural Machinery .

5- alzoubi,I., Rajabipor,A., Ahmadi,H., Mirzaei,F.,(2015) Optimization of Land Leveling Operations through Least Square Method and Its Comparison with the Genetic Algorithm and Particle Swarm Optimization Algorithm. IRANIAN JOUNAL OF BIOSYSTEM ENGINEERINHG.45:105-112.

6- Alzoubi, I., Delavar, M., Mirzaei, F., &Nadjar Arrabi, B. (2017).Integrating artificial neural network and imperialist competitive algorithm (ICA), to predict the energy consumption for land leveling. International Journal of Energy Sector Management. doi.org/10.1108/IJESM-01-2017-0003

Alzoubi, I., Delavar, M., Mirzaei, F., &NadjarArrabi, B. (2017). Application of Sensitivity analysis, and ANFIS and ANN models in prediction of environmental indicators for land leveling. Agricultural

Vitality productive structures' issue coordinated into the region and CO2 outflow decrease techniques and approaches is one of the principle worries in the European Union (EU). So as to accomplish a viable effect, rather than simply focusing on the improvement regarding vitality productivity to one specific structure, this methodology expects difficulties to be tackled in a whole region or a whole region. As needs be, it is critical understanding the exhaustive private structure stock models in the urban condition ready to advance an economical vitality arranging. In this paper we portray another philosophy dependent on two diverse displaying approaches top-down and base up with the intend to assess the structures vitality utilization model of a district. This technique is for the most part dependent on data that is as of now accessible on building stock from the writing and information assortment (i.e., specialized branch of region, web, vitality inspectors and others) which is later moved into the Geographic data framework (GIS). Into this in future investigations GIS stage gives the data on vitality execution in the entire city just as making the urban vitality maps for evaluating retrofitting situations and bolster dynamic for approach usage to accomplish feasible urban arranging. This investigation is a piece of a progressing Smart City examine study, national bunch venture named Zero Energy Buildings in Smart Urban Districts (EEB) and is tried in a medium measured town in the Piedmont locale (Italy), and the outcomes are talked about. The particular vitality use for space warming and boiling water creation as capacity of the structure development period and the surface to volume proportion S/V for private structures for Settimo Torinese.

The particular vitality use for space warming and heated water creation as capacity of the structure development period and the surface to volume proportion S/V for private structures for Settimo Torinese.GIS-Based Energy Consumption Model at the Urban Scale for the Building Stock Sara Torabi Moghadam1, Guglielmina Mutani2, Patrizia Lombardi1 1 Interuniversity Department of Regional and Urban Studies and Planning, Politecnico di Torino, 2 Department of Energy, Politecnico di Torino Abstract Energy effective structures' issue coordinated into the area and CO2 outflow decrease methodologies and approaches is one of the primary worries in the European Union (EU). So as to accomplish a successful effect, rather than simply focusing on the improvement as far as vitality effectiveness to one specific structure, this methodology expects difficulties to be fathomed in a whole region or a whole region. As needs be, it is noteworthy understanding the extensive private structure stock models in the urban condition ready to advance a reasonable vitality arranging. In this paper we portray another philosophy dependent on two distinctive displaying approaches top-down and base up with the intend to assess the structures vitality utilization model of a district. This approach is chiefly founded on data that is as of now accessible on building stock from the writing and information assortment (i.e ., specialized branch of district, web, vitality reviewers and others) which is later moved into the Geographic data framework (GIS). Into this in future examinations GIS stage gives the data on vitality execution in the entire city just as making the urban vitality maps for surveying retrofitting situations and bolster dynamic for strategy usage to accomplish economical urban arranging. This investigation is a piece of a progressing Smart City look into study, national bunch venture named Zero Energy Buildings in Smart Urban Districts (EEB) and is tried in a medium estimated town in the Piedmont locale (Italy), and the outcomes are talked about. Catchphrase: Geographic Information System (GIS), Thermal Energy Consumption Model, Building Stock, Urban Scale Introduction Nowadays, there is a monstrous effect on vitality request and thus GHG outflows because of how urban areas are acting and developing. In Italy, the vitality balance in 2013 has exhibited a further decrease of the vitality interest for about - 1.9% contrasted with 2012 level. This pattern is going on because of the monetary emergency, yet additionally to the consequence of the effective usage of vitality productivity arrangements. To be sure, the end clients of vitality represented about 126.6 (Mtoe) with a decrease of 1% contrasted with 2012. It is essential that lone area where the vitality utilization has expanded is the development one (+ 5.6%). Especially in the structure part, vitality utilization is affected by the spatial association. In this manner, where the object is the appraisal of all around reachable vitality reserve funds and the ozone depleting substances decreased emanations, it is urgent to expand the attention on the structure stock at urban scale. In like manner, various methodologies and apparatuses are created for the spatial portrayal of vitality request, creation and CO2 discharges, for example, a Geographical Information Systems (GIS). The usage of spatial examination through GIS apparatuses can be imperative to oversee, document, investigation, and geo-referenced representation of the vitality information and to enhance the vitality sources accessible on the region. It is required to comprehend the structure vitality execution in a whole region or district to

accomplish a feasible vitality arranging methodologies that accelerate the vitality remodel and vitality effectiveness strategy in required existing structures. Truth be told, the Sustainable Energy Action Plan (SEAP) advanced by the European Commission raises the systems for understanding the ozone harming substance decreases required by 2020 for districts that have joined the Covenant of Mayors .