Kejia Hu

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Education

M.A., Hydraulic engineering, China Agricultural University, 2022

Dissertation: Optimization design of a photovoltaic-driven capacitive deionization-drip irrigation system based on particle swarm algorithm

Dissertation advisor: Qian Tan

GPA: 3.67 / 4.00

B.A., Hydraulic and hydropower engineering, China Agricultural University, 2019

Dissertation: Assessing clean energy-driven brackish water desalination-irrigation technology in drylands of Northwest China based on multi-criteria group decision making

Dissertation advisor: Qian Tan

GPA: 3.67 / 4.00

Research Interest

Electrochemical desalination, water treatment, process control, optimal design

Publication

1. **Hu, K.**, Tan, Q., Zhang, T.Y., and Wang, S. (2020). Assessing technology portfolios of clean energy-driven desalination-irrigation systems with interval-valued intuitionistic fuzzy sets. *Renewable & Sustainable Energy Reviews* 132.109500.

Scholarship & Awards

2020, National Scholarship of China

2020, Merit Student of China Agricultural University

2019&2020, Excellent temporary assistant of China Agricultural University

2019&2020, Academic Scholarship for Master's Degree of China Agricultural University

2017&2018, National Endeavor Fellowship of China

2017, Mathematical Contest In Modeling（Honorable Mention）

2017, Outstanding Volunteer of Xizhi Education Fund Scholarship

2016, Xizhi Education Fund Scholarship

Languages

Native in Chinese, proficient at English (IEITs 7.0).

Computer skill

Microsoft Office, Matlab, Lingo, Origin, CAD, GIS, EndNote

Research Experience

Optimized parameters of a clean energy-driven capacitive deionization-drip irrigation system.

Simulated the total radiation on each tilted surface by inputting ten years of daily data on the horizontal surface in Urumqi, Xinjiang, and then obtained the optimal tilt angle and the maximum power generation. With the objective of minimizing system cost and the constraints of wastage and deficit of energy supply and desalinated water, optimized the size of relevant facilities of the system, based on particle swarm algorithm.

Determined technology portfolio for clean energy-driven desalination-irrigation (CEDI) systems.

Improved a Multi-Criteria Group Decision Making approach (MCGDM) based on Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS) and Interval-Valued Intuitionistic Fuzzy Entropies (IVIFS). Assessed six potential technology portfolio of CEDI system in northwest China under the criteria of agriculture, ecology, economy, and system performance using developed MCGDM framework.

Explored salt removal abilities of different fabric coverings from saline soils.

Filled soil columns with saline soil and saturated them with saltwater, then covered with four kinds of fabric materials (nylon, cotton, geotextile, and gauze), heated them under infrared lights for 25

days. Examined the microstructural characteristics of the fabric materials before and after the experiments, as well as the crystallization conditions on the soil surface, using scanning electron microscope (SEM). Further investigated the performance of geotextile materials of different areal densities on salt removal by repeating experiments with commercially available geotextiles with areal densities of 200, 300, 400, and 500 g/m^2.

Participated Projects

1. Evaluation and regulation methods of coordinated water-energy-food development in irrigation areas based on synergetic and uncertain system analysis, 2018-2021, Funded by Natural Science Foundation of China, No.51822905

2. INFEWS: U.S.-China: An Integrated Technology-Environment-Economic Modeling Platform for Water-Energy-Food Systems in Arid Regions, 2018-2022, Funded by Natural Science Foundation of China, No.51861125103.

3. National undergraduate innovation and entrepreneurship training program of China, 2017-2018, funded by Higher Education Division, the Ministry of Education of China.