

Environmental Sciences and Renewable Energy 2021

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The role of modern control and optimization in power grids and microgrids with 100% penetration level of renewable energies.

With the increase of penetration level of renewable energies in power grids and microgrids, several issues were raised in terms of the energy system stability. Two main issues are on top of the reasons for blackouts which voltage and frequency instability. To solve the instability problems, many controllers and optimization techniques are offered. In this presentation, several modern frequency controllers of different 100% renewable energy microgrids will be presented. Also, optimal design of voltage controllers in a power grid with 100% renewables will be presented. At the end, to maximize the penetration level of renewable energy through different optimization techniques in the Egyptian grid will be presented.

Biography

Dr. Hady Habib received his Ph.D. degree in 2019 at the age of 29 years old, in Electrical Power Engineering, from Helwan University, Egypt including associated research with Texas A&M University, USA. He got his B.Sc. degree in 2011, and M.Sc. degree in 2014 from Helwan University.

Dr. Hady is the chairman and the initiator of the IEEE Industrial Electronics Society Egypt Chapter. He initiated the chapter to serve Egyptian researchers and engineers to connect with each other and with experts worldwide aiming to have solutions to Egyptian problems in Energy and water in addition to leading Egypt to be part of the fifth industrial revolution.

He is currently working as a lecturer in the Energy Engineering Program, Faculty of Engineering, Heliopolis University. He is also the head of research unit in the Faculty of Engineering, Heliopolis University.



Dr. Hady H. Fayek

Heliopolis University, Egypt.

Hady published more than 20 papers in different journals and conferences, his area of study includes smart grid, 100% renewable energy, photovoltaics, marine energy, power system control, microgrids, optimization, control engineering, and water energy food nexus.

Hady was the main organizer of two international conferences and two webinars under the umbrella of IEEE Industrial Electronics Egypt Chapter in partnership with IEEE Industrial Electronics Guadalajara, Mexico Chapter, IEEE Industrial Electronics Industry Applications Power Electronics Austria Chapter, IEEE Digital Reality and Heliopolis University such as Sustainable smart city conference, Engineering applications during COVID19 conference, smart city applications webinar and contemporary issues in smart grids webinar.

In 2020, he won best second paper award in the inter-chapter paper competition from IEEE Industrial Electronics society over 84 papers. The paper has the title "100% Winter Sustainable Energy Platform at Heliopolis University", the research was aiming to convert his home institution to 100% renewable energy campus through a proposed intelligent scheme.

In 2017, he won a grant to study teaching and research of renewable energy in Texas A&M University, the USA from Fulbright association and now he is a member of Fulbright alumni.

In 2016, he won the best paper award from the Trinex Tempus project on creating a model to integrate sustainable water, green energy, and secured food together. The paper entitled "Design & Control of an Agriculture Photovoltaic Reverse Osmosis Desalination System Case Study Heliopolis University."

Hady is a guest editor and reviewer in many IEEE, Tech-science, MDPI, Elsevier and IET transactions, journals and conferences. He is also a member of the Industrial Electronics Smart Grid Technical committee in the IEEE. He is also a keynote speaker in many conferences and webinars.

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