Dr. Carl Ngai Man Ho Bio

Dr. Carl Ho received the BEng and MEng double degrees, in 2002, and the PhD degree, in 2007, in electronic engineering from the City University of Hong Kong. He was involved in research on the development of dynamic power quality conditioning technology during his Ph.D degree. In 2007, he joined ABB Switzerland. He has been appointed as Scientist, Principal Scientist, and R&D Principal Engineer. He has led a research project team at ABB Switzerland to develop Solar Inverter technologies for three years. In October 2014, he joined the University of Manitoba in Canada, currently, he is Associate Professor and Canada Research Chair in Efficient Utilization of Electric Power. He established the Renewable-energy Interface and Grid Automation (RIGA) Lab at the University of Manitoba and takes up the challenge of research into Microgrid technologies, Photovoltaic Inverters, Power-Hardware-in-the-loop, Power Quality Conditioning and Wide Bandgap semiconductors. Dr. Ho is currently an IEEE Senior Member and an Associate Editor of the IEEE Transactions on Power Electronics (TPEL) and the IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE). He received the Best JESTPE Associate Editor Award in 2018 and "A Second Place Prize Paper Award for 2018" in the TPEL. And his leading graduate student project team received "Best Student Team Regional Award" of the IEEE Empower a Billion Lives 2019 competition in the Americas region.

Speech Title

Power Electronics in DC Mircogrids for Connecting Communities

Over 3 billion people are living in energy poverty and more than 1 billion people have no access to electricity according to the International Energy Agency. These people primarily live in remote and developing areas. Traditional energy solutions that depend on large power plants and long transmission lines are not feasible in these areas due to the high cost and geographical limitations. Moreover, providing power to billions of people with conventional fuel-burning plants would generate giga tons of additional carbon emissions. Alternatively, off-grid dc microgrid systems based on photovoltaic (PV) power harvesting have the potential that would make electricity affordable even in remote locations. The feasibility of this approach is growing, because the price of photovoltaic (PV) panels and energy storage devices is decreasing and new power electronic technologies are being developed that will make low-voltage dc (LVDC) systems highly suitable for the electrification of rural areas. This presentation will discuss the technologies of power electronics in the LVDC dc microgrids for connecting communities. Moreover, the current status of technology development and implementation of dc microgrids at RIGA lab will be reviewed and discussed.