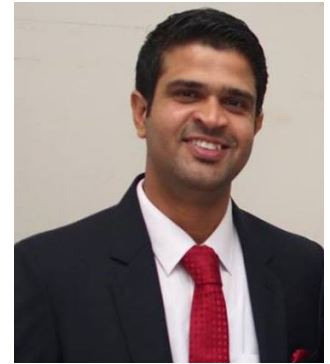


# Dr. PERVEZ HAMEED SHAIKH



## HEC Approved PhD. Supervisor

Nationality: Pakistan  
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## 1. Motivation

Learning something new every day and the endurance of curiosity in work from the day past is the liveliest feeling to work ahead.

## 2. Education

Degree	University	C.G.P.A	Year
Doctor of Philosophy (PhD.)	Universiti Teknologi PETRONAS (UTP)	Research	May 2015
Master of Engineering (Electrical Power)	Mehran University of Engineering and Technology Jamshoro	3.88/4.00	July 2011
B.E (Electrical Engg.)	Mehran University of Engineering and Technology Jamshoro	3.77/4.00	December 2008

## 3. Employment

- i. **Manager R & D** (May 2017 – to date)  
Office of Research Innovation and Commercialization (ORIC)  
Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan.

### Roles & Responsibilities

- Managing and developing research collaborations
- Industry oriented research promotion

- Interdisciplinary and multidisciplinary research orientations
  - Promotion of potential research projects for commercialization
  - Triple Helix and Quad Helix concept of research and development
  - Entrepreneurial and Innovation projections
  - Trainings, workshops and seminars organization and management
  - Office staff task orientation and motivation for workplace decorum
- ii. **Assistant Professor** (May 2015 – May 2017), Visiting Onwards  
Department of Electrical Engineering  
Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan.
- iii. **Lecturer** (March 2009 – May 2015)  
Department of Electrical Engineering  
Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan.

**Roles & Responsibilities**

- Inculcate various subjects in undergraduate (Electrical Power Transmission, Basic Electrical Engineering) and graduates (Energy Management) levels.
  - Design and prepare effective presentations for easy understanding of various courses.
  - Develop and implement learning and communication methods with student centered approach for better understanding.
  - Undertaking various research projects at undergraduate and graduate level.
  - Evaluation and Assessment of coursework scripts, quizzes and practical workbooks.
  - Counseling and liaising students batch advisor for academic, social and technical affairs.
- iv. **Teaching Assistant** (December 2011 – Jan 2015)  
Department of Electrical and Electronic Engineering  
Universiti Teknologi PETRONAS (UTP)

**Roles & Responsibilities**

- Teach and conduct lectures for undergraduate subjects (Electrical and Energy Systems, Electrical Machines).
- Conduct lab for the subjects of (Electrical and Energy Systems, Electrical Machines).
  - Design and prepare presentations and lecture notes.
- Coordinate various research projects for Poster presentations and research paper writings.
- Coordinator for outcome based education (OBE) system (Coordinating with faculty, Monitoring of Course files and managing smart lab systems).

v. **Additional Responsibilities**

- a. International Standard Organization (ISO) Coordinator at Electrical Department, Mehran UET Jamshoro (September 2015 – June 2017)
- b. Member selection board 104<sup>th</sup> meeting of Mehran UET Jamshoro (May 16, 2017)
- c. Member review committee of Poster competition at Department of Electrical Engineering (2015, 2016)

## **4. Areas of Expertise**

Building Energy Systems and Management, Energy Economics, Conservation and Efficiency, Renewable Energy Systems, Micro grids, Load Profiling and Forecasting, Artificial Intelligence (Fuzzy Systems (FIS), Neural Networks (NN) and Adaptive Neuro Fuzzy Inference System (ANFIS)), Renewable Energy, Electrical Power Transmission, Distribution and Utilization.

## **5. Research Activities**

i. **Thesis**

**(a) Doctor of Philosophy (PhD): Building Energy and Comfort Management System Using Augmented Multi Objective Genetic Algorithm**

Buildings technology that are heating cooling and illumination systems consumes 40% of world's energy for maintaining indoor comfort that results 40 % of carbon emissions. Growth in population, increasing demand for building services, improved comfort levels and time spent in the buildings causes increase in energy consumption. Building automation is considered as one of the potential solution for reduction of building energy and carbon emissions. The hierarchical system with master coordinator and multiple peripheral coordinating systems have been considered with the comfort-associated parameters such as temperature, humidity, illumination and air quality. In addition, two evolutionary multi-objective optimization methods such as multi-objective genetic algorithm (MOGA) and augmented multi-objective genetic algorithm (A-MOGA) are employed to generate set of Pareto-optimal solutions. The trade-off solutions between energy and comfort are useful in decision making for BECM in complex environment.

**(b) Master of Engineering (ME): Potential of Green House Gas Abatement of Domestic Lighting Fixtures in Hyderabad Electric Supply Company (HESCO)**

Masters Research project accomplished the End Use Consumer Data analysis for GHG emissions from the different lighting fixtures and its replacement with the efficient CFLs along with the future projections for the GHG emissions using multi-variable regression analysis on Minitab 15 statistical software.

**(c) Bachelor of Engineering (BE): Comprehensive Study of Voltage Sag in Transmission and Distribution System:**

Final year thesis project in which the complete analysis of voltage sag in power system, its causes and the effects on system and its equipment behavior at the load side.

**ii. Projects Undertaken**

**(a) Integration of Solar and Wind Power Systems in Direct Current Micro-grid Setup (Principal Investigator)**

The project is in completion phase and initiated as joint project awarded to Mehran UET Jamshoro and UET Pehsawar by US-Pakistan Centre for Advanced Studies in Energy (USPCAS-E). The grant of 3 million rupees has been allocated for the aforementioned project. The project will be solely carried out at Mehran UET Jamshoro. This project aimed to develop a prototype of the integrated DC micro grid employing the solar and wind power generation sources.

**(b) Residential Energy End Use Consumer Survey:**

It was Survey project awarded by Hyderabad Electric Supply Company (HESCO) on behalf of World Bank to Mehran University Centre for Energy and Development (MUCED). HESCO distributes electric power to almost 1.4 million consumers. It supplies electricity to entire Sindh except Karachi. I played a role as core management member. I trained, managed, and supervised the field enumerators and data entry operators. I also visited survey field as monitoring team head and worked as Field and Data Entry Monitor. I analyzed the collected data and prepared the draft report.

**(c) Energy Audit of Mehran University of Engineering & Technology Jamshoro:**

I was involved in load calculation of the Buildings and analyzed load consumption patterns. I calculated the financial benefits of reducing the energy bill by using energy conservation techniques. Project was carried out by Mehran University Center for Energy & Development (MUCED)

### **iii. Reviewer of Peer Review International Journals**

Contributing in the research community for better and proper conduct of research publications. Various international peer reviewed journals papers have been reviewed upon the editors request the journal's list is as follows;

1. Sustainable Cities and Society (Elsevier)
2. Energy Efficiency (Springer)
3. Energy and Buildings (Elsevier)
4. IEEE Power and Energy Systems Journal (IEEE)
5. Journal of Renewable and Sustainable Energy (AIP Journals)
6. Neural Computing and Applications (Springer)
7. Renewable Energy Focus (Elsevier)
8. IEEE Transactions on Control Systems Technology (IEEE)
9. Journal of Environmental Planning and Management (Taylor & Francis online)
10. International Journal of Sustainable Engineering (Taylor & Francis online)
11. International Journal of Electrical Power and Energy Systems (Elsevier)
12. Journal of Ambient Intelligence and Smart Environments (IOS Press)

### **iv. Technical Reports**

Worked as an active coordinator in a Zero-Budget Center “Mehran University Center for Energy and Development (MUCED)”. In which undertaken main projects and worked for technical reports and project deliverables includes;

- Electricity Distribution and Transmission Improvement Project (EDTIP) under World Bank Financing, Third Party Validation/Monitoring of Environmental & Social Management Plan (ESMP) and Resettlement Plan (RP).
- Expression for Interest for Conducting a Market Study on Broadcast Media through Leading Universities.(PEMRA)
- Expression for Interest for Re-Routification/ Customer Census of Hyderabad Electric Supply Company (HESCO)

- Expression for Interest: Solicitation of Proposals for Performance Contracting under ENERCON Pakistan
- Expression for Interest for Registration of Energy Service Companies (ESCOs) for Efficiency of Water Pumping Systems under ENERCON
- Expression for Interest for Improving the efficiency of Water Pumping System and Introduction of Renewable Energy for Multiple Use under Alternative Energy Development Board (AEDB)
- Expression for Interest for Re-Routification/ Customer Census of Faisalabad Electric Supply Company (FESCO)
- Expression for Interest for Sindh Board of Investment
- Proposal for Ministry of Youth Affairs
- Pre-Qualification for Sindh Education Foundation
- Expression for Interest of Load profile Management of Hyderabad Electric Supply Company (HESCO)
- Reduction of Non-technical Losses of Hyderabad Electric Supply Company (HESCO)

#### **v. Seminars/Workshops Attended**

- Financial Management Workshop at UniversitiTeknologi PETRONAS, 1-2 November, 2014.
- ICCOEE-2014 Sub-Committee Member at World Engineering Science and Technology Congress (ESTCON-2014)
- Innovation Forum, Academic and Research Exhibition (ACADREX 2013), 25th October 2013.
- Program Eco-Outing Day, Taman Tasik Taiping and Zoo Taiping Perak, 13 October 2013.
- Journal Writing Course at UniversitiTeknologi PETRONAS (2nd May, 2012)
- Deployment Methodologies and Implementation by Microsoft Pakistan and Higher Education Commission (1st June, 2011)
- Building Capacity on Climate Change Adaptation in Coastal Areas of Pakistan, a project of WWF with the support of European Commission (EC). (Karachi, 2011)

- Energy Conservation Training and Mass Awareness Campaign Project, Workshop/Seminar on Agriculture, Buildings, Transport, Industry and Power and Clean Development Mechanism organized by ENERCON, Ministry of Environment GoP with National Cleaner Production Center Foundation (NCPCF). (Karachi, 2010)
- Demand Side Management (DSM). (MUET, 2010)
- Electrical Power Distribution System Planning. (MUET, 2010)

#### vi. Events Organized

- **Lead Organizer** International DICE Energy and Water – 2017 (DEW'17) Exhibition and Conference, at Mehran UET Jamshoro, 12-13 December, 2017.
- **Conference Secretary** at 4<sup>th</sup> International Conference on Energy Environment & Sustainable Development, November 01-03, 2016.
- **Lead Organizer**, An Outreach Program for Undergraduate and Postgraduate Studies, United States Center for Advanced Studies in Energy (USPCAS-E), National University of Science & Technology (NUST) Islamabad, held at M.D Hall Mehran UET Jamshoro.
- **Lead Coordinator**, Biomass Resource Utilization, A project of British Council joint venture between Mehran UET Jamshoro and Coventry University London, held at M.D Hall Mehran UET Jamshoro.

## 6. Grants and Funding Successfully Obtained

Sr. #	Agency	Role	Agency Type	Purpose	Time/ Duration	Amount (Millions)
7	Higher Education Commission (HEC) Pakistan, Sindh Engro Coal Mining Company (SECMC), Pakistan Science Foundation (PSF), Pakistan Council of Science & Technology (PCST), ABM, EPSON, Rastek, PakTech IDEAL Computers etc.	Lead Organizer DICE Energy and Water – 2017 (DEW'17)	Industry, Academia and Government	Exhibition and Projects Display	12-13 Dec., 2017	1.5
6	Higher Education Commission (HEC) Pakistan under National Research Program for Universities (NRPU)	Principal Investigator	Research & Development + Academic	Research Project Funding	3 years	2.1 On-going
5	Higher Education Commission (HEC) Pakistan under National	Co-Principal	Research & Development	Research Project	3 years	2.1 On-going

	Research Program for Universities (NRPU)	Investigator	+ Academic	Funding		
4	Higher Education Commission (HEC) Pakistan, Pakistan Petroleum Limited (PPL), Sindh Engro Coal Mining Company (SECMC), Pakistan Science Foundation (PSF), Technology Links, PakTech etc.	Conference Secretary Energy Environment and Sustainable Development (EESD'16)	Academic Body in Pakistan, Industries, Science Foundations	EESD'16 Conference Organization at Mehran UET Jamshoro (As a Team Member in capacity of Conference Secretary)	01-03 Nov., 2016	3.9
3	Higher Education Commission (HEC) Pakistan	Lead Author	Academic Body in Pakistan	Conference funding for Australia	3-5 Dec., 2016	0.217
2	United States Pakistan Center for Advanced Studies in Energy (USPCAS-E), University of Engineering & Technology Peshawar	Principal Investigator	Research & Development + Academic	Research Project Funding	Sept. 2016 to Aug. 2017	3.07
1	University Teknologi PETRONAS (UTP) Malaysia	PhD. Scholar	Academic	PhD. Scholarship	Dec. 2012 to March 2015	More than 4

## 7. Publications

### (a) Peer Reviewed Articles

- [21] **PH Shaikh**, ZH Leghari, NH Mirjat, F Shaikh, AR Solangi, T Jan, MA Uqaili, "Wind–PV-Based Hybrid DC Microgrid (DCMG) Development: An Experimental Investigation and Comparative Economic Analysis" *Energies*, 11(5), 1295, 2018.
- [20] Z. Abbas, K. Harijan, **P.H. Shaikh**, G.D. Walasai, F. Ali, "Effect of Ambient Temperature and Relative Humidity on Solar PV System Performance: A Case Study of Quaid-e-Azam Solar Park, Pakistan Sindh University Research Journal-SURJ (Science Series) 49 (4), 721-726, 2017.
- [19] Faheemullah Shaikh, Qiang Ji, **Pervez Hameed Shaikh**, Nayyar Hussain Mirjat, Muhammad Aslam Uqaili, "Forecasting China's natural gas demand based on optimized nonlinear grey models" *Energy*, Volume 140, 941–951, December 2017.
- [18] Ashfaque Ahmed Baloch, **Pervez Hameed Shaikh**, Faheemullah Shaikh, Zohaib Hussain Leghari, Muhammad Aslam Uqaili, "Simulation tools applications for artificial lighting in buildings" *Renewable and Sustainable Energy Reviews*, doi: //doi.org/10.1016/j.rser.2017.10.035.
- [17] Faheemullah Shaikh, Qiang Ji, Ying Fan, **Pervez Hameed Shaikh**, Muhammad Aslam Uqaili, "Modelling an optimal foreign natural gas import scheme for China" *Journal of Natural Gas Science and Engineering* Volume 40, 267–276, April 2017.
- [16] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Anwer Ali Sahito, Perumal Nallagownden, Irraivan Elamvazuthi, and M.S. Shaikh, "Building Energy for Sustainable Development in Malaysia: A Review" *Renewable and Sustainable Energy Reviews*, Volume 75, 1392-1403, August 2017.



- [15] ZA Memon, AA Sahito, ZH Leghari, **PH Shaikh**, “Output Voltage Characteristics of Wind Energy System Considering Wind Speed and Number of Blades” Sindh University Research Journal-SURJ (Science Series) 48 (2), 281-284, 2016.
- [14] **Pervez Hameed Shaikh**, Anwer Ali Sahito, Aslam Pervaiz Memon, “Photovoltaic Cell modelling and simulation strategies”, Quaid-e-Awam University Research Journal of Engineering, Science and Technology, Volume 15, 2, Jul-Dec 2016.
- [13] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, “Intelligent Multi-objective Optimization for Building Energy and Comfort Management” International Journal King Saud University – Engineering Sciences, doi. 10.1016/j.jksues.2016.03.001.
- [12] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, Taib Ibrahim, “Intelligent Multi-objective Control and Management for Smart Energy Efficient Buildings” International Journal of Electrical Power and Energy Systems 74: 403-409, 2016.
- [11] N. Sheikh, **P.H. Shaikh**, A. Baloch, Z.A. Memon, “Non-linear Empirical Model for Energy and Thermal Comfort in Buildings” Sindh University Research Journal (Science Series) Vol. 48(1): 57-60, 2016.
- [10] A.A. Sahito, Z.A. Memon, **P.H. Shaikh**, A.A. Rajper, S.A. Memon, “Unbalanced loading; An Overlooked Contributor to Power Losses in HESCO” Sindh University Research Journal (Science Series), 47(4): 779-782, 2015.
- [9] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, Taib Ibrahim, “A Review on Optimized Control System for Building Energy and Comfort Management of Smart Sustainable Buildings”, Renewable and Sustainable Energy Reviews, 34: 409-429, 2014.
- [8] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden, Irraivan Elamvazuthi, “Stochastic Optimized Intelligent Controller for Smart Energy Efficient Buildings” Sustainable Cities and Society, 13: 41–45, 2014.
- [7] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden, Irraivan Elamvazuthi, “Indoor Building Fuzzy Control of Energy and Comfort Management” Research Journal of Applied Sciences, Engineering and Technology, 6(23): 4445-4450, 2013.
- [6] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden, Irraivan Elamvazuthi, “Building Energy Management through a Distributed Fuzzy Inference System” International Journal of Engineering and Technology, 5(4): 3236-3242, 2013.
- [5] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden, Irraivan Elamvazuthi, Taib Ibrahim, “Robust Stochastic Control Model for Energy and Comfort Management of Buildings” Australian Journal of Basic and Applied Sciences, 7(10): 137-144, 2013.
- [4] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden, Irraivan Elamvazuthi, “Intelligent Optimized Control System for Energy and Comfort Management in Efficient and Sustainable Buildings”, Procedia Technology 11, 99-106, 2013.
- [3] **Pervez Hameed Shaikh**, Faheemullah Shaikh, Mushtaq Mirani, “Solar Energy: Topographical Asset for Pakistan”, Applied Solar Energy, Vol. 49, No. 1, pp. 49–53, 2013.
- [2] Mahesh Rathi, **Pervez Hameed Shaikh**, Faheemullah Shaikh, Mohammad Aslam Uqaili, “Energy Conservation through Motors in Pakistan’s Industrial Sector- Need to Use of

Energy Efficient Motors” International Journal of Computer Applications, Volume 54–No.5, pp. 1-7, September 2012.

- [1] Faheemullah Shaikh, **Pervez Hameed Shaikh**, Mushtaq Mirani, Mohammad Aslam Uqaili, “Multi Criteria Optimization Algorithm for Economic Dispatch Complications for Sustainable Interconnected Power System” International Journal of Computer Applications, Volume 50, No.4, pp. 22-25, July 2012.

#### (b) Book Chapter

- [2] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Irraivan Elamvazuthi and Perumal Nallagownden, “Maximum Power Point Tracking (MPPT) of Partially Shaded Photovoltaic Cells: A Technical Review” Materials and processes for energy: communicating current research and technological developments; Energy Book Series –2013 Edition, Formatex Research Center, pp. 75 - 83, 2013.
- [1] **Pervez Hameed Shaikh**, Faheemullah Shaikh, Anwer Ali Sahito, Muhammad Aslam Uqaili, Zulfiqar Umrani, “Smart Energy Systems for Cost Effective Energy Efficient Retrofit” Cost-Effective Energy Efficient Building Retrofitting: Materials, Technologies, Optimization and Case Studies, Woodhead Publishing Series in Civil and Structural Engineering – Elsevier, 2016.

#### (c) Conferences

- [17] Oshaque Ali, **Pervez Hameed Shaikh**, Mazhar Uddin, Zeeshan Anjum Memon, “Energy Saving by Double Electrochromic Glazing-A Case Study for Central Library MUET, Jamshoro, Pakistan” 3rd International Electrical Engineering Conference IEEC - 9th & 10th February, 2018 at IEP Karachi Centre.
- [16] **Pervez Hameed Shaikh**, Tariqullah Jan, Asif Raza Solangi, Zohaib Hussain Leghari, Ashfaque Ahmed Baloch, Muhammad Aslam Uqaili, “Performance Analysis of Wind–Photovoltaic–Battery based DC Microgrid Setup for off–grid Applications” In proceedings of IEEE 3rd International Conference on Engineering, Technologies and Social Sciences, Asian Institute of Technology Conference Center, Thailand, 7-8 August, 2017.
- [15] Imdad Ali Gopang, **Pervez Hameed Shaikh**, Zubair Ahmed Memon, Zohaib Hussain Leghari and Meher-U-Nisa Gopang, “Efficiency Enhancement of Solar Photovoltaic through Parabolic Dish Concentrator”, In the 1<sup>th</sup> International Conference on Industrial Engineering and Management Applications (IEMA) 2017, 20-22 February, 2017.
- [14] **Pervez Hameed Shaikh**, Tariqullah Jan, Zohaib Hussain Leghari, Muhammad Aslam Uqaili, Faheemullah Shaikh, “Direct Current Micro Grid Bus Voltage Regulation for Photovoltaic and Wind Integrated Systems” In the Emerging Energy Technologies Summit and Exhibition 2016 (EETSE'16) at Melbourne, Australia, from Dec. 05 – 07, 2016.
- [13] Muhammad Awais, Shayan Ahmed, Ashfaque Ahmed Baloch, Pervez Hameed Shaikh, Faheemullah Shaikh, Asif Raza Solangi “Building Energy Management System by Using Hybrid Technology Microcontroller Based Occupancy Sensor”, In Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development 2016 (EESD'16), 1-3 November, 2016 ISBN:9789697710003.
- [12] Muhammad Awais, Shayan Ahmed, Ashfaque Ahmed Baloch, Pervez Hameed Shaikh, Faheemullah Shaikh, Zeeshan Anjum Memon “Solar powered building automation system

by using passive infrared sensor and lead acid battery backup”, In Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development 2016 (EESD’16), 1-3 November, 2016 ISBN:9789697710003.

- [11] Ashfaque Ahmed Baloch, **Pervez Hameed Shaikh**, Zubair Ahmed Memon, Muhammad Awais, Shayan Ahmed, Faheemullah Shaikh, “GUI- based simulations platform for energy and visual comfort management in buildings”, In Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development 2016 (EESD’16), 1-3 November, 2016 ISBN:9789697710003.
- [10] Shah Rukh Gul, Lala Rukh Memon, **Pervez Hameed Shaikh**, Zohaib Hussain Leghari, Danesh Kumar, Furqan Ali Memon, “Development of Standalone Hybrid Solar Wind Power Generation Model for Remote Areas of Pakistan”, In Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development 2016 (EESD’16), 1-3 November, 2016 ISBN:9789697710003.
- [9] Asif Raza Solangi, Tariqullah Jan, Nayyar Hussain, Zohaib Hussain Leghari, Anwer Ali Sahito, **Pervez Hameed Shaikh**, “Regulation of Bus Voltage for Renewable Energy Based Direct Current Micro Grid”, In Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development 2016 (EESD’16), 1-3 November, 2016 ISBN:9789697710003.
- [8] A. Talpur, R. R. Oath, **P. H. Shaikh**, A. A. Baloch, (2016). In-Pipe Hydropower, an Unexplored Green Energy”, In Proceedings of the 4th International Conference on Energy, Environment and Sustainable Development 2016 (EESD’16), 1-3 November, 2016 ISBN:9789697710003.
- [7] Umair Ahmed, Mukhtiar Ahmed Mahar, **Pervez Hameed Shaikh**, Adil Ahmed, “Inrush current minimization for the single phase transformer”, In Proceedings of SIMEC-2016, 15-16 July, Karachi, Pakistan.
- [6] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd. Nor, Shah Murad Tunio, Perumal Nallagownden and Irraivan Elamvazuthi, “Energy and Visual Comfort Management in Buildings with Intelligent Optimized Control System” 3rd International Conference on Energy, Environment and Sustainable Development (EESD), Oct 22-24, 2014.
- [5] J. Rajaram, N M Nor, T. Ibrahim, H. Daud, **Pervez Hameed Shaikh**, “A Novel Supervisory Control for Residential Building Protection System”, 2014 IEEE 8th International Power Engineering and Optimization Conference (PEOCO2014), Langkawi, Malaysia, 24-25 March 2014, pp. 286-290.
- [4] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, “Optimized Intelligent Control System for Indoor Thermal Comfort and Energy Management of Buildings”5th International Conference on Intelligent and Advanced Systems, June 3-6, 2014 (ICIAS 2014).
- [3] **Pervez Hameed Shaikh**, Nursyarizal Bin MohdNor, Perumal Nallagownden and Irraivan Elamvazuthi, “Indoor Visual Comfort and Energy Management through the Intelligent Optimized Control System” Bi-Annual Postgraduate Conference (BAPC, 2013), UniversitiTeknologi PETRONAS (UTP), May 7-10, 2014.
- [2] **Pervez Hameed Shaikh**, Nursyarizal Bin MohdNor, Perumal Nallagownden and Irraivan Elamvazuthi, “Intelligent Optimized Control System for Energy and Comfort Management in Efficient and Sustainable Buildings” International Conference on Electrical Engineering and Informatics 2013 (ICEEI 2013, 24-25 June, 2013), UniversitiKebangsaan Malaysia (UKM).

- [1] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, “Intelligent Optimized Illumination Control System for Building Energy and Comfort Management” 2nd Annual Postgraduate Conference (APC, 2013), Universiti Teknologi PETRONAS (UTP), July 3-6, 2013.

#### **(d) Exhibitions**

- [5] **Pervez Hameed Shaikh (Principal Investigator)**, Tariquallah Jan (Co-Principal Investigator), Zohaib Hussain Leghari, Asif Solanghi, Ashfaque Baloch, “Integration of Solar and Wind Power system in DC microgrid” at National Conference on Green Energy Technologies at united states Pakistan Centre for Advanced Studies (USPCAS-E) Peshawar, May 18, 2017.
- [4] **Pervez Hameed Shaikh (Supervisor)**, Jawad Ahmed Channa, Tauseef Ahmed Memon, Waleed Ahmed Memon, Imran Rafique Memon, Abdul Shakoor Chandio, "Integration of Wind & Solar Power System in Direct Current Micro-Grid Setup" 65-DICE-2015, December, 22-23, 2015, NED-DICE Energy Exhibition 2015. [**Cash Prize of Rs-60,000/- along with DICE-Energy 2015 Shield**]
- [3] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, “Evolutionary Multi-objective Optimization for Building Energy and Comfort Management in Automated Green and Sustainable Buildings”, Science and Engineering Design Exhibition (SEDEX’33), Aug. 6-7, 2014, **SILVER Medal**.
- [2] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, “Building Energy and Comfort Management Using Intelligent Control and Stochastic Optimization”, Science and Engineering Design Exhibition (SEDEX’32), Dec. 11-12, 2013, **SILVER Medal**.
- [1] **Pervez Hameed Shaikh**, Nursyarizal Bin Mohd Nor, Perumal Nallagownden and Irraivan Elamvazuthi, “Intelligent Optimized Stochastic Control for Sustainable Smart Buildings”, Science and Engineering Design Exhibition (SEDEX’31), Aug. 21-22, 2013, **BRONZE Medal**.

## **8. Professional References**

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