

# References

- [1] S. Arun and M. Selvan, “Intelligent residential energy management system for dynamic demand response in smart buildings,” *IEEE Systems Journal*, vol. 12, no. 2, pp. 1329–1340, 2017.
- [2] M. Pipattanasomporn, M. Kuzlu, and S. Rahman, “An algorithm for intelligent home energy management and demand response analysis,” *IEEE Transactions on Smart Grid*, vol. 3, no. 4, pp. 2166–2173, 2012.
- [3] W. Su and J. Wang, “Energy management systems in microgrid operations,” *The Electricity Journal*, vol. 25, no. 8, pp. 45–60, 2012.
- [4] J. Laustsen, “Energy efficiency requirements in building codes, energy efficiency policies for new buildings. IEA Information Paper,” 2008. [Online]. Available: <https://www.osti.gov/etdeweb/servlets/purl/971038>
- [5] S. Rafique, M. J. Hossain, M. S. H. Nizami, U. B. Irshad, and S. C. Mukhopadhyay, “Energy management systems for residential buildings with electric vehicles and distributed energy resources,” *IEEE Access*, vol. 9, pp. 46 997–47 007, 2021.
- [6] D. Lasquety-Reyes, “Number of smart homes forecast in the world from 2017 to 2025,” 2021, last accessed 15 Jun 2021. [Online]. Available: <https://www.statista.com/forecasts/887613/number-of-smart-homes-in-the-smart-home-market-in-the-world>
- [7] A. Chunekar, S. Varshney, and S. Dixit, “Residential electricity consumption in india: what do we know,” *Prayas (Energy Group), Pune*, vol. 4, 2016.
- [8] S. Arun and M. Selvan, “Demand response frameworks for smart residential buildings,” in *Operation of Smart Homes*. Springer, 2021, pp. 93–130.

- [9] G. Strbac, "Demand side management: Benefits and challenges," *Energy Policy*, vol. 36, no. 12, pp. 4419–4426, 2008.
- [10] P. Palensky and D. Dietrich, "Demand side management: Demand response, intelligent energy systems, and smart loads," *IEEE Transactions on Industrial Informatics*, vol. 7, no. 3, pp. 381–388, 2011.
- [11] M. A. Zehir and M. Bagriyanik, "Demand side management by controlling refrigerators and its effects on consumers," *Energy Conversion and Management*, vol. 64, pp. 238–244, 2012.
- [12] V. Pradhan, V. M. Balijepalli, and S. A. Khaparde, "An effective model for demand response management systems of residential electricity consumers," *IEEE Systems Journal*, vol. 10, no. 2, pp. 434–445, 2014.
- [13] M. Chaabene, M. B. Ammar, and A. Elhajjaji, "Fuzzy approach for optimal energy-management of a domestic photovoltaic panel," *Applied Energy*, vol. 84, no. 10, pp. 992–1001, 2007.
- [14] B. Parida, S. Iniyar, and R. Goic, "A review of solar photovoltaic technologies," *Renewable and Sustainable Energy Reviews*, vol. 15, no. 3, pp. 1625–1636, 2011.
- [15] R. El-Azab, "Smart homes: potentials and challenges," *Clean Energy*, vol. 5, no. 2, pp. 302–315, 2021.
- [16] "Renewable energy resources." [Online]. Available: <https://www.irena.org/statistics>
- [17] Y. Mo, T. H.-J. Kim, K. Brancik, D. Dickinson, H. Lee, A. Perrig, and B. Sinopoli, "Cyber-physical security of a smart grid infrastructure," *Proceedings of the IEEE*, vol. 100, no. 1, pp. 195–209, 2011.
- [18] "Wef2019 Global Risk Report Ranks Cyber Attacks Among Most Likely Global Threats," 2019. [Online]. Available: [www.cpomagazine.com/cyber-security](http://www.cpomagazine.com/cyber-security)
- [19] D. Case, "Analysis of the Cyber-Attack on the Ukrainian Power Grid," *Electricity Information Sharing and Analysis Center (E-ISAC)*, vol. 388, pp. 1–29, 2016, Washington DC.

- [20] B. P. Esther and K. S. Kumar, “A survey on residential demand side management architecture, approaches, optimization models and methods,” *Renewable and Sustainable Energy Reviews*, vol. 59, pp. 342–351, 2016.
- [21] K. Herter, “Residential implementation of critical-peak pricing of electricity,” *Energy Policy*, vol. 35, no. 4, pp. 2121–2130, 2007.
- [22] P. Centolella, “The integration of price responsive demand into regional transmission organization (rto) wholesale power markets and system operations,” *Energy*, vol. 35, no. 4, pp. 1568–1574, 2010.
- [23] N. Ruiz, I. Cobelo, and J. Oyarzabal, “A direct load control model for virtual power plant management,” *IEEE Transactions on Power Systems*, vol. 24, no. 2, pp. 959–966, 2009.
- [24] D. Weers and M. Shamsedin, “Testing a new direct load control power line communication system,” *IEEE Transactions on Power Delivery*, vol. 2, no. 3, pp. 657–660, 1987.
- [25] Y. Wu, V. K. Lau, D. H. Tsang, L. P. Qian, and L. Meng, “Optimal energy scheduling for residential smart grid with centralized renewable energy source,” *IEEE Systems Journal*, vol. 8, no. 2, pp. 562–576, 2013.
- [26] A. Y. Saber and G. K. Venayagamoorthy, “Resource scheduling under uncertainty in a smart grid with renewables and plug-in vehicles,” *IEEE Systems Journal*, vol. 6, no. 1, pp. 103–109, 2011.
- [27] C. O. Adika and L. Wang, “Autonomous appliance scheduling for household energy management,” *IEEE Transactions on Smart Grid*, vol. 5, no. 2, pp. 673–682, 2013.
- [28] Y. Liu, S. Hu, H. Huang, R. Ranjan, A. Y. Zomaya, and L. Wang, “Game-theoretic market-driven smart home scheduling considering energy balancing,” *IEEE Systems Journal*, vol. 11, no. 2, pp. 910–921, 2015.
- [29] F. Luo, G. Ranzi, C. Wan, Z. Xu, and Z. Y. Dong, “A multistage home energy management system with residential photovoltaic penetration,” *IEEE Transactions on Industrial Informatics*, vol. 15, no. 1, pp. 116–126, 2018.

- [30] F. Luo, Z. Y. Dong, Z. Xu, W. Kong, and F. Wang, "Distributed residential energy resource scheduling with renewable uncertainties," *IET Generation, Transmission & Distribution*, vol. 12, no. 11, pp. 2770–2777, 2018.
- [31] J. Yang, J. Liu, Z. Fang, and W. Liu, "Electricity scheduling strategy for home energy management system with renewable energy and battery storage: a case study," *IET Renewable Power Generation*, vol. 12, no. 6, pp. 639–648, 2017.
- [32] V. Pilloni, A. Floris, A. Meloni, and L. Atzori, "Smart home energy management including renewable sources: A qoe-driven approach," *IEEE Transactions on Smart Grid*, vol. 9, no. 3, pp. 2006–2018, 2016.
- [33] H.-H. Chang, W.-Y. Chiu, H. Sun, and C.-M. Chen, "User-centric multiobjective approach to privacy preservation and energy cost minimization in smart home," *IEEE Systems Journal*, vol. 13, no. 1, pp. 1030–1041, 2018.
- [34] F. Y. Melhem, O. Grunder, Z. Hammoudan, and N. Moubayed, "Energy management in electrical smart grid environment using robust optimization algorithm," *IEEE Transactions on Industry Applications*, vol. 54, no. 3, pp. 2714–2726, 2018.
- [35] Y. Huang, L. Wang, W. Guo, Q. Kang, and Q. Wu, "Chance constrained optimization in a home energy management system," *IEEE Transactions on Smart Grid*, vol. 9, no. 1, pp. 252–260, 2016.
- [36] A. Anvari-Moghaddam, H. Monsef, and A. Rahimi-Kian, "Optimal smart home energy management considering energy saving and a comfortable lifestyle," *IEEE Transactions on Smart Grid*, vol. 6, no. 1, pp. 324–332, 2014.
- [37] A.-H. Mohsenian-Rad and A. Leon-Garcia, "Optimal residential load control with price prediction in real-time electricity pricing environments," *IEEE Transactions on Smart Grid*, vol. 1, no. 2, pp. 120–133, 2010.
- [38] A.-H. Mohsenian-Rad, V. W. Wong, J. Jatskevich, R. Schober, and A. Leon-Garcia, "Autonomous demand-side management based on game-theoretic energy consumption scheduling for the future smart grid," *IEEE Transactions on Smart Grid*, vol. 1, no. 3, pp. 320–331, 2010.

- [39] S. Althaher, P. Mancarella, and J. Mutale, “Automated demand response from home energy management system under dynamic pricing and power and comfort constraints,” *IEEE Transactions on Smart Grid*, vol. 6, no. 4, pp. 1874–1883, 2015.
- [40] X. Hou, J. Wang, T. Huang, T. Wang, and P. Wang, “Smart home energy management optimization method considering energy storage and electric vehicle,” *IEEE Access*, vol. 7, pp. 144 010–144 020, 2019.
- [41] P. Du and N. Lu, “Appliance commitment for household load scheduling,” *IEEE Transactions on Smart Grid*, vol. 2, no. 2, pp. 411–419, 2011.
- [42] R. Lu, S. H. Hong, and M. Yu, “Demand response for home energy management using reinforcement learning and artificial neural network,” *IEEE Transactions on Smart Grid*, vol. 10, no. 6, pp. 6629–6639, 2019.
- [43] F. Ruelens, B. J. Claessens, S. Vandael, B. De Schutter, R. Babuška, and R. Belmans, “Residential demand response of thermostatically controlled loads using batch reinforcement learning,” *IEEE Transactions on Smart Grid*, vol. 8, no. 5, pp. 2149–2159, 2016.
- [44] S. Sisodiya, K. Shejul, and G. B. Kumbhar, “Scheduling of demand-side resources for a building energy management system,” *International Transactions on Electrical Energy Systems*, vol. 27, no. 9, p. e2369, 2017.
- [45] J. Abushnaf and A. Rassau, “An efficient scheme for residential load scheduling integrated with demand side programs and small-scale distributed renewable energy generation and storage,” *International Transactions on Electrical Energy Systems*, vol. 29, no. 2, p. e2720, 2019.
- [46] A. H. Sharifi and P. Maghouli, “Energy management of smart homes equipped with energy storage systems considering the par index based on real-time pricing,” *Sustainable Cities and Society*, vol. 45, pp. 579–587, 2019.
- [47] J. Abushnaf, A. Rassau, and W. Górniewicz, “Impact on electricity use of introducing time-of-use pricing to a multi-user home energy management system,” *International Transactions on Electrical Energy Systems*, vol. 26, no. 5, pp. 993–1005, 2016.

- [48] M. D. de Souza Dutra, M. F. Anjos, and L. Digabel, “A realistic energy optimization model for smart-home appliances,” *International Journal of Energy Research*, vol. 43, no. 8, pp. 3237–3262, 2019.
- [49] R. Khalid, N. Javaid, M. H. Rahim, S. Aslam, and A. Sher, “Fuzzy energy management controller and scheduler for smart homes,” *Sustainable Computing: Informatics and Systems*, vol. 21, pp. 103–118, 2019.
- [50] S. N. Makhadmeh, A. T. Khader, M. A. Al-Betar, S. Naim, A. K. Abasi, and Z. A. A. Alyasseri, “Optimization methods for power scheduling problems in smart home: Survey,” *Renewable and Sustainable Energy Reviews*, vol. 115, p. 109362, 2019.
- [51] R. Belfkira, L. Zhang, and G. Barakat, “Optimal sizing study of hybrid wind/PV/diesel power generation unit,” *Solar Energy*, vol. 85, no. 1, pp. 100–110, 2011.
- [52] H. Yang, L. Lu, and W. Zhou, “A novel optimization sizing model for hybrid solar-wind power generation system,” *Solar Energy*, vol. 81, no. 1, pp. 76–84, 2007.
- [53] M. H. Elkazaz, A. Hoballah, and A. M. Azmy, “Artificial intelligent-based optimization of automated home energy management systems,” *International Transactions on Electrical Energy Systems*, vol. 26, no. 9, pp. 2038–2056, 2016.
- [54] R. Yaqub, S. Ahmad, A. Ahmad, and M. Amin, “Smart energy-consumption management system considering consumers’ spending goals (sems-ccsg),” *International Transactions on Electrical Energy Systems*, vol. 26, no. 7, pp. 1570–1584, 2016.
- [55] X. Chen, T. Wei, and S. Hu, “Uncertainty-aware household appliance scheduling considering dynamic electricity pricing in smart home,” *IEEE Transactions on Smart Grid*, vol. 4, no. 2, pp. 932–941, 2013.
- [56] M. D. de Souza Dutra, M. F. Anjos, and S. Le Digabel, “A realistic energy optimization model for smart-home appliances,” *International Journal of Energy Research*, vol. 43, no. 8, pp. 3237–3262, 2019.

- [57] Z. Zhao, W. C. Lee, Y. Shin, and K.-B. Song, "An optimal power scheduling method applied in home energy management system based on demand response," *ETRI Journal*, vol. 35, no. 4, pp. 677–686, 2013.
- [58] M. A. A. Pedrasa, T. D. Spooner, and I. F. MacGill, "Coordinated scheduling of residential distributed energy resources to optimize smart home energy services," *IEEE Transactions on Smart Grid*, vol. 1, no. 2, pp. 134–143, 2010.
- [59] A. Ouammi, "Optimal power scheduling for a cooperative network of smart residential buildings," *IEEE Transactions on Sustainable Energy*, vol. 7, no. 3, pp. 1317–1326, 2016.
- [60] H. Karami, M. J. Sanjari, S. Hadavi, S. H. Hosseinian, and G. B. Gharehpetian, "Stochastic load effect on home energy system scheduling optimization," *International Transactions on Electrical Energy Systems*, vol. 25, no. 10, pp. 2412–2426, 2015.
- [61] S. L. Arun and M. P. Selvan, "Dynamic demand response in smart buildings using an intelligent residential load management system," *IET Generation, Transmission & Distribution*, vol. 11, no. 17, pp. 4348–4357, 2017.
- [62] S. Paul and N. P. Padhy, "Resilient scheduling portfolio of residential devices and plug-in electric vehicle by minimizing conditional value at risk," *IEEE Transactions on Industrial Informatics*, vol. 15, no. 3, pp. 1566–1578, 2018.
- [63] M. Shafie-Khah and P. Siano, "A stochastic home energy management system considering satisfaction cost and response fatigue," *IEEE Transactions on Industrial Informatics*, vol. 14, no. 2, pp. 629–638, 2017.
- [64] S. Li, J. Yang, W. Song, and A. Chen, "A real-time electricity scheduling for residential home energy management," *IEEE Internet of Things Journal*, vol. 6, no. 2, pp. 2602–2611, 2018.
- [65] S. Ahmad, M. Naeem, and A. Ahmad, "Low complexity approach for energy management in residential buildings," *International Transactions on Electrical Energy Systems*, vol. 29, no. 1, p. e2680, 2019.

- [66] D. Setlhaolo, X. Xia, and J. Zhang, "Optimal scheduling of household appliances for demand response," *Electric Power Systems Research*, vol. 116, pp. 24–28, 2014.
- [67] D. Setlhaolo and X. Xia, "Optimal scheduling of household appliances with a battery storage system and coordination," *Energy and Buildings*, vol. 94, pp. 61–70, 2015.
- [68] K. N. Kumar, K. Vijayakumar, and C. Kalpesh, "Virtual energy storage capacity estimation using ann-based kwh modelling of refrigerators," *IET Smart Grid*, vol. 1, no. 2, pp. 31–39, 2018.
- [69] Z. Wu, S. Zhou, J. Li, and X.-P. Zhang, "Real-time scheduling of residential appliances via conditional risk-at-value," *IEEE Transactions on Smart Grid*, vol. 5, no. 3, pp. 1282–1291, 2014.
- [70] T. Hubert and S. Grijalva, "Modeling for residential electricity optimization in dynamic pricing environments," *IEEE Transactions on Smart Grid*, vol. 3, no. 4, pp. 2224–2231, 2012.
- [71] G. Yan, D. Liu, J. Li, and G. Mu, "A cost accounting method of the li-ion battery energy storage system for frequency regulation considering the effect of life degradation," *Protection and Control of Modern Power Systems*, vol. 3, no. 1, pp. 1–9, 2018.
- [72] G. He, Q. Chen, C. Kang, P. Pinson, and Q. Xia, "Optimal bidding strategy of battery storage in power markets considering performance-based regulation and battery cycle life," *IEEE Transactions on Smart Grid*, vol. 7, no. 5, pp. 2359–2367, 2015.
- [73] B. Xu, J. Zhao, T. Zheng, E. Litvinov, and D. S. Kirschen, "Factoring the cycle aging cost of batteries participating in electricity markets," *IEEE Transactions on Power Systems*, vol. 33, no. 2, pp. 2248–2259, 2017.
- [74] U. Datta, N. Saiprasad, A. Kalam, J. Shi, and A. Zayegh, "A price-regulated electric vehicle charge-discharge strategy for g2v, v2h, and v2g," *International Journal of Energy Research*, vol. 43, no. 2, pp. 1032–1042, 2019.

- [75] D. Mahmood, N. Javaid, I. Ahmed, N. Alrajeh, I. A. Niaz, and Z. A. Khan, “Multi-agent-based sharing power economy for a smart community,” *International Journal of Energy Research*, vol. 41, no. 14, pp. 2074–2090, 2017.
- [76] D. Lee, H.-Y. Huang, W.-S. Lee, and Y. Liu, “Artificial intelligence implementation framework development for building energy saving,” *International Journal of Energy Research*, vol. 44, no. 14, pp. 11 908–11 929, 2020.
- [77] L. Yu, W. Xie, D. Xie, Y. Zou, D. Zhang, Z. Sun, L. Zhang, Y. Zhang, and T. Jiang, “Deep reinforcement learning for smart home energy management,” *IEEE Internet of Things Journal*, vol. 7, no. 4, pp. 2751–2762, 2019.
- [78] X. Wu, X. Hu, S. Moura, X. Yin, and V. Pickert, “Stochastic control of smart home energy management with plug-in electric vehicle battery energy storage and photovoltaic array,” *Journal of Power Sources*, vol. 333, pp. 203–212, 2016.
- [79] A. Akbari-Dibavar, S. Nojavan, B. Mohammadi-Ivatloo, and K. Zare, “Smart home energy management using hybrid robust-stochastic optimization,” *Computers & Industrial Engineering*, vol. 143, p. 106425, 2020.
- [80] A. Kazemdehdashti, M. Mohammadi, A. Seifi, and M. Rastegar, “Stochastic energy management in multi-carrier residential energy systems,” *Energy*, vol. 202, p. 117790, 2020.
- [81] Y. Mo and B. Sinopoli, “False data injection attacks in control systems,” in *Preprints of the 1st workshop on Secure Control Systems*, 2010, pp. 1–6.
- [82] S. McLaughlin, D. Podkuiko, and P. McDaniel, “Energy theft in the advanced metering infrastructure,” in *International Workshop on Critical Information Infrastructures Security*. Springer, 2009, pp. 176–187.
- [83] F. M. Cleveland, “Cyber security issues for advanced metering infrastructure (ami),” in *2008 IEEE Power and Energy Society General Meeting-Conversion and Delivery of Electrical Energy in the 21st Century*. IEEE, 2008, pp. 1–5.
- [84] K. Song, D. Seo, H. Park, H. Lee, and A. Perrig, “Omap: One-way memory attestation protocol for smart meters,” in *2011 IEEE Ninth International Symposium*

- on Parallel and Distributed Processing with Applications Workshops*. IEEE, 2011, pp. 111–118.
- [85] W. Wang and Z. Lu, “Cyber security in the smart grid: Survey and challenges,” *Computer Networks*, vol. 57, no. 5, pp. 1344–1371, 2013.
- [86] B. Jin, C. Dou, and D. Wu, “False data injection attacks and detection on electricity markets with partial information in a micro-grid-based smart grid system,” *International Transactions on Electrical Energy Systems*, vol. 30, no. 12, p. e12661, 2020.
- [87] Y. Wang and G. Yan, “A new model approach of electrical cyber physical systems considering cyber security,” *IEEJ Transactions on Electrical and Electronic Engineering*, vol. 14, no. 2, pp. 201–213, 2019.
- [88] G. Liang, J. Zhao, F. Luo, S. R. Weller, and Z. Y. Dong, “A review of false data injection attacks against modern power systems,” *IEEE Transactions on Smart Grid*, vol. 8, no. 4, pp. 1630–1638, 2016.
- [89] L. Lei, W. Yang, C. Yang, and H. Shi, “False data injection attack on consensus-based distributed estimation,” *International Journal of Robust and Nonlinear Control*, vol. 27, no. 9, pp. 1419–1432, 2017.
- [90] X. Liu, Z. Li, Z. Shuai, and Y. Wen, “Cyber attacks against the economic operation of power systems: A fast solution,” *IEEE Transactions on Smart Grid*, vol. 8, no. 2, pp. 1023–1025, 2016.
- [91] B. Li, T. Ding, C. Huang, J. Zhao, Y. Yang, and Y. Chen, “Detecting false data injection attacks against power system state estimation with fast go-decomposition approach,” *IEEE Transactions on Industrial Informatics*, vol. 15, no. 5, pp. 2892–2904, 2018.
- [92] L. Liu, M. Esmalifalak, Q. Ding, V. A. Emesih, and Z. Han, “Detecting false data injection attacks on power grid by sparse optimization,” *IEEE Transactions on Smart Grid*, vol. 5, no. 2, pp. 612–621, 2014.

- [93] K. Manandhar, X. Cao, F. Hu, and Y. Liu, "Detection of faults and attacks including false data injection attack in smart grid using kalman filter," *IEEE Transactions on Control of Network Systems*, vol. 1, no. 4, pp. 370–379, 2014.
- [94] O. Kosut, L. Jia, R. J. Thomas, and L. Tong, "Malicious data attacks on smart grid state estimation: Attack strategies and countermeasures," in *2010 first IEEE International Conference on Smart Grid Communications*. IEEE, 2010, pp. 220–225.
- [95] Q. Yang, L. Chang, and W. Yu, "On false data injection attacks against kalman filtering in power system dynamic state estimation," *Security and Communication Networks*, vol. 9, no. 9, pp. 833–849, 2016.
- [96] W. Yu, D. Griffith, L. Ge, S. Bhattarai, and N. Golmie, "An integrated detection system against false data injection attacks in the smart grid," *Security and Communication Networks*, vol. 8, no. 2, pp. 91–109, 2015.
- [97] S. A. Salinas and P. Li, "Privacy-preserving energy theft detection in microgrids: A state estimation approach," *IEEE Transactions on Power Systems*, vol. 31, no. 2, pp. 883–894, 2015.
- [98] Y. Huang, J. Tang, Y. Cheng, H. Li, K. A. Campbell, and Z. Han, "Real-time detection of false data injection in smart grid networks: An adaptive cusum method and analysis," *IEEE Systems Journal*, vol. 10, no. 2, pp. 532–543, 2014.
- [99] H. Li and Z. Han, "Manipulating the electricity power market via jamming the price signaling in smart grid," in *2011 IEEE GLOBECOM Workshops (GC Wkshps)*. IEEE, 2011, pp. 1168–1172.
- [100] Z. Lu, W. Wang, and C. Wang, "From jammer to gambler: Modeling and detection of jamming attacks against time-critical traffic," in *2011 Proceedings IEEE INFOCOM*. IEEE, 2011, pp. 1871–1879.
- [101] L. Xie, Y. Mo, and B. Sinopoli, "False data injection attacks in electricity markets," in *2010 First IEEE International Conference on Smart Grid Communications*. IEEE, 2010, pp. 226–231.

- [102] C. Liao, C.-W. Ten, and S. Hu, "Strategic FRTU deployment considering cybersecurity in secondary distribution network," *IEEE Transactions on Smart Grid*, vol. 4, no. 3, pp. 1264–1274, 2013.
- [103] J. Qi, A. Hahn, X. Lu, J. Wang, and C.-C. Liu, "Cybersecurity for distributed energy resources and smart inverters," *IET Cyber-Physical Systems: Theory & Applications*, vol. 1, no. 1, pp. 28–39, 2016.
- [104] Y. Liu, S. Hu, and T.-Y. Ho, "Vulnerability assessment and defense technology for smart home cybersecurity considering pricing cyberattacks," in *2014 IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*. IEEE, 2014, pp. 183–190.
- [105] Y. Liu, Y. Zhou, and S. Hu, "Combating coordinated pricing cyberattack and energy theft in smart home cyber-physical systems," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 37, no. 3, pp. 573–586, 2017.
- [106] U. R. Anuebunwa, H.-S. Rajamani, R. Abd-Alhameed, and P. Pillai, "Investigating the impacts of cyber-attacks on pricing data of home energy management systems in demand response programs," in *2018 IEEE Power & Energy Society General Meeting (PESGM)*. IEEE, 2018, pp. 1–5.
- [107] J. Bugeja, A. Jacobsson, and P. Davidsson, "An analysis of malicious threat agents for the smart connected home," in *2017 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)*. IEEE, 2017, pp. 557–562.
- [108] Y. Zhou, Y. Liu, and S. Hu, "Smart home cyberattack detection framework for sponsor incentive attacks," *IEEE Transactions on Smart Grid*, vol. 10, no. 2, pp. 1916–1927, 2017.
- [109] C. Lee, L. Zappaterra, K. Choi, and H.-A. Choi, "Securing smart home: Technologies, security challenges, and security requirements," in *2014 IEEE Conference on Communications and Network Security*. IEEE, 2014, pp. 67–72.
- [110] T. A. Abdullah, W. Ali, S. Malebary, and A. A. Ahmed, "A review of cyber security challenges attacks and solutions for internet of things based smart home,"

- International Journal of Computer Science and Network Security*, vol. 19, no. 9, p. 139, 2019.
- [111] H. Lin and N. W. Bergmann, “Iot privacy and security challenges for smart home environments,” *Information*, vol. 7, no. 3, p. 44, 2016.
- [112] A. Jacobsson and P. Davidsson, “Towards a model of privacy and security for smart homes,” in *2015 IEEE 2nd World Forum on Internet of Things (WF-IoT)*. IEEE, 2015, pp. 727–732.
- [113] W. Ali, G. Dustgeer, M. Awais, and M. A. Shah, “IoT based smart home: Security challenges, security requirements and solutions,” in *2017 23rd International Conference on Automation and Computing (ICAC)*. IEEE, 2017, pp. 1–6.
- [114] A. Arabo, “Cyber security challenges within the connected home ecosystem futures,” *Procedia Computer Science*, vol. 61, pp. 227–232, 2015.
- [115] J. Wurm, K. Hoang, O. Arias, A.-R. Sadeghi, and Y. Jin, “Security analysis on consumer and industrial iot devices,” in *2016 21st Asia and South Pacific design automation conference (ASP-DAC)*. IEEE, 2016, pp. 519–524.
- [116] A. Sajeev and H.-S. Rajamani, “Cyber-attacks on smart home energy management systems under aggregators,” in *2020 International Conference on Communications, Computing, Cybersecurity, and Informatics (CCCI)*. IEEE, 2020, pp. 1–5.
- [117] Y. Liu, S. Hu, and A. Y. Zomaya, “The hierarchical smart home cyberattack detection considering power overloading and frequency disturbance,” *IEEE Transactions on Industrial Informatics*, vol. 12, no. 5, pp. 1973–1983, 2016.
- [118] Y. Liu and S. Hu, “Cyberthreat analysis and detection for energy theft in social networking of smart homes,” *IEEE Transactions on Computational Social Systems*, vol. 2, no. 4, pp. 148–158, 2015.
- [119] A. Saha, S. Rahman, M. Pipattanasomporn, and M. Kuzlu, “On security of a home energy management system,” in *IEEE PES Innovative Smart Grid Technologies, Europe*. IEEE, 2014, pp. 1–5.

- [120] Y. Guo, C.-W. Ten, S. Hu, and W. W. Weaver, “Preventive maintenance for advanced metering infrastructure against malware propagation,” *IEEE Transactions on Smart Grid*, vol. 7, no. 3, pp. 1314–1328, 2015.
- [121] J. Wurm, Y. Jin, Y. Liu, S. Hu, K. Heffner, F. Rahman, and M. Tehranipoor, “Introduction to cyber-physical system security: A cross-layer perspective,” *IEEE Transactions on Multi-Scale Computing Systems*, vol. 3, no. 3, pp. 215–227, 2016.
- [122] G. Hernandez, O. Arias, D. Buentello, and Y. Jin, “Smart nest thermostat: A smart spy in your home,” *Black Hat USA*, no. 2015, 2014.
- [123] Y. Liu, S. Hu, J. Wu, Y. Shi, Y. Jin, Y. Hu, and X. Li, “Impact assessment of net metering on smart home cyberattack detection,” in *2015 52nd ACM/EDAC/IEEE Design Automation Conference (DAC)*. IEEE, 2015, pp. 1–6.
- [124] P. Zhuang and H. Liang, “False data injection attacks against state-of-charge estimation of battery energy storage systems in smart distribution networks,” *IEEE Transactions on Smart Grid*, vol. 12, no. 3, pp. 2566–2577, 2020.
- [125] T. O. Olowu, S. Dharmasena, H. Jafari, and A. Sarwat, “Investigation of false data injection attacks on smart inverter settings,” in *2020 IEEE CyberPELS (CyberPELS)*. IEEE, 2020, pp. 1–6.
- [126] G. Tertytchny, H. Karbouj, L. Hadjidemetriou, C. Charalambous, M. K. Michael, M. Sazos, and M. Maniatakos, “Demonstration of man in the middle attack on a commercial photovoltaic inverter providing ancillary services,” in *2020 IEEE CyberPELS (CyberPELS)*. IEEE, 2020, pp. 1–7.
- [127] A. Barua and M. A. Al Faruque, “Hall spoofing: a noninvasive DoS attack on grid-tied solar inverter,” in *29th USENIX Security Symposium (USENIX Security 20)*, 2020, pp. 1273–1290.
- [128] N. K. Kandasamy, “Prosumer site power interruption attacks: exploiting the reactive power control feature in smart inverters,” *IET Generation, Transmission & Distribution*, vol. 14, no. 23, pp. 5372–5380, 2020.

- [129] M. Lindström, H. Sasahara, X. He, H. Sandberg, and K. H. Johansson, “Power injection attacks in smart distribution grids with photovoltaics,” in *2021 European Control Conference (ECC)*. IEEE, 2021, pp. 529–534.
- [130] C.-H. Lo and N. Ansari, “Consumer: A novel hybrid intrusion detection system for distribution networks in smart grid,” *IEEE Transactions on Emerging Topics in Computing*, vol. 1, no. 1, pp. 33–44, 2013.
- [131] K. Khanna, B. K. Panigrahi, and A. Joshi, “Data integrity attack in smart grid: optimised attack to gain momentary economic profit,” *IET Generation, Transmission & Distribution*, vol. 10, no. 16, pp. 4032–4039, 2016.
- [132] J. Fan, Q. Li, and G. Cao, “Privacy disclosure through smart meters: Reactive power based attack and defense,” in *2017 47th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*. IEEE, 2017, pp. 13–24.
- [133] Y. Wu, B. Chen, J. Weng, Z. Wei, X. Li, B. Qiu, and N. Liu, “False load attack to smart meters by synchronously switching power circuits,” *IEEE Transactions on Smart Grid*, vol. 10, no. 3, pp. 2641–2649, 2018.
- [134] M. Ismail, M. F. Shaaban, M. Naidu, and E. Serpedin, “Deep learning detection of electricity theft cyber-attacks in renewable distributed generation,” *IEEE Transactions on Smart Grid*, vol. 11, no. 4, pp. 3428–3437, 2020.
- [135] P. Yi, T. Zhu, Q. Zhang, Y. Wu, and J. Li, “A denial of service attack in advanced metering infrastructure network,” in *2014 IEEE International Conference on Communications (ICC)*. IEEE, 2014, pp. 1029–1034.
- [136] S. Boudko and H. Abie, “An evolutionary game for integrity attacks and defences for advanced metering infrastructure,” in *Proceedings of the 12th European Conference on Software Architecture: Companion Proceedings*, 2018, pp. 1–7.
- [137] Y. A. Katsigiannis, P. S. Georgilakis, and E. S. Karapidakis, “Hybrid simulated annealing–tabu search method for optimal sizing of autonomous power systems with renewables,” *IEEE Transactions on Sustainable Energy*, vol. 3, no. 3, pp. 330–338, 2012.

- [138] J. H. Chow and J. J. Sanchez-Gasca, *Wind Power Generation and Modeling*, 2020, pp. 487–530.
- [139] M. H. Khan, A. U. Asar, N. Ullah, F. R. Albogamy, and M. K. Rafique, “Modeling and optimization of smart building energy management system considering both electrical and thermal load,” *Energies*, vol. 15, no. 2, p. 574, 2022.
- [140] I. Alsaidan, A. Khodaei, and W. Gao, “A comprehensive battery energy storage optimal sizing model for microgrid applications,” *IEEE Transactions on Power Systems*, vol. 33, no. 4, pp. 3968–3980, 2017.
- [141] J. Vetter, P. Novák, M. R. Wagner, C. Veit, K.-C. Möller, J. Besenhard, M. Winter, M. Wohlfahrt-Mehrens, C. Vogler, and A. Hammouche, “Ageing mechanisms in lithium-ion batteries,” *Journal of Power Sources*, vol. 147, no. 1-2, pp. 269–281, 2005.
- [142] D.-I. Stroe, M. Swierczynski, S. K. Kær, and R. Teodorescu, “Degradation behavior of lithium-ion batteries during calendar ageing—the case of the internal resistance increase,” *IEEE Transactions on Industry Applications*, vol. 54, no. 1, pp. 517–525, 2017.
- [143] M. Kassas, “Modeling and simulation of residential hvac systems energy consumption,” *Procedia Computer Science*, vol. 52, pp. 754–763, 2015.
- [144] N. V. Sahinidis, “Baron: A general purpose global optimization software package,” *Journal of Global Optimization*, vol. 8, no. 2, pp. 201–205, 1996.
- [145] M. Tawarmalani and N. V. Sahinidis, “Global optimization of mixed-integer nonlinear programs: A theoretical and computational study,” *Mathematical Programming*, vol. 99, no. 3, pp. 563–591, 2004.
- [146] Y. Liu, S. Hu, and T.-Y. Ho, “Leveraging strategic detection techniques for smart home pricing cyberattacks,” *IEEE Transactions on Dependable and Secure Computing*, vol. 13, no. 2, pp. 220–235, 2015.
- [147] O. Laib, M. T. Khadir, and L. Mihaylova, “A gaussian process regression for natural gas consumption prediction based on time series data,” in *2018 21st International Conference on Information Fusion (FUSION)*. IEEE, 2018, pp. 55–61.

# List of Publications

## The publications originating from this thesis are:

1. **Sethi, B.K.**, Singh, A., Mohanty, S.R., Singh, D. and Misra, R.K., 2022. Game Theoretic Smart Residential Buildings Energy Management System Under False Data Injection Attack. IEEE Internet of Things Journal, 10(1), pp.110-119.
2. **Sethi, B.K.**, Singh, A., Singh, D. and Misra, R., 2021. Optimal energy management of smart buildings under cyber attack. International Journal of Energy Research, 45(14), pp.19895-19908.
3. **Sethi, B.K.**, Mukherjee, D., Singh, D., Misra, R.K. and Mohanty, S.R., 2020. Smart home energy management system under false data injection attack. International Transactions on Electrical Energy Systems, 30(7), p.e12411.

## The relevant publications during doctoral degree:

1. Singh, A., **Sethi, B.K.**, Singh, D. and Misra, R.K., 2021. Shapley Value Method and Stochastic Dantzig–Wolfe Decomposition for Decentralized Scheduling of Multimicrogrid. IEEE Systems Journal.
2. Singh, A., **Sethi, B.K.**, Kumar, A., Singh, D. and Misra, R.K., 2022. Three-Level Hierarchical Management of Active Distribution System With Multimicrogrid. IEEE Systems Journal.
3. Mukherjee, D., **Sethi, B.K.**, Chakraborty, S., Banerjee, R., Guchhait, P.K. and Bhunia, J., Real-time Mitigation of Effects of False Data in Smart Grid: A Data Diode Approach. In 2021 IEEE 9th Region 10 Humanitarian Technology Conference (R10-HTC) (pp. 1-6). IEEE.