Dr. Hanumantha Rao Bokkisam, Ph.D.

Room No:219, Department of Electrical Engineering, NIT Rourkela, Odisha, India.
https://scholar.google.com/citations?user=IcFgVZQAAAAJ&hl=en
https://www.linkedin.com/in/dr-hanumantha-rao-bokkisam-ph-d-789a5455/
bokkisamh@nitrkl.ac.in, hanu.nitt@gmail.com
+91 7702007571

Employment History

2023 – Cont. **Assistant Professor,** Department of Electrical Engineering, National Institute of Technology Rourkela, Odisha, India.

2021 – 2023 **Senior Power System Researcher,** School of Electrical & Electronics Engineering, University College Dublin, Ireland.

2013 – 2017 **Assistant Professor,** Department of Electrical & Electronics Engineering, GITAM University, Visakhapatnam, Andhra Pradesh, India.

Education

2017 – 2021 **Ph.D., Electrical Engineering (9.25/10)** Department of EEE, **NIT Trichy**, T.N., India. Thesis title: *" Investigations on framework of transactive energy market for residential community microgrid"*.

2011 – 2013 **M.Tech., Electrical Engineering (7.0/10)** Department of EEE, **NITK Surathkal**, K.N, India. Thesis title: *" Design and development of an emulator for distribution automation"*.

2004 – 2008 **B.Tech., Electrical Engineering (74.40%)** Department of EEE, S.K.I.T, Srikalahasti, A.P., India. Thesis title: *" Closed loop operation of Separately excited DC motor"*.

2001 – 2003 **Class XII, M.P.C (82.80%)** A.G.S Junior College, Tirupati, Chittoor (Dt), A.P., India.

2000 – 2001 **Class X, M.Bi.P.C (74.00%)** Z.P. High School, Muchivolu (vi), Chittoor (Dt), A.P., India.

Research

2021 – 2023 **Blockchain transactions in the electricity industry: beyond tokenized energy.** This research is a forward-looking piece of research that will guide how system operators adapt to blockchain technologies. The project will show how positive interaction effects can arise so that a vibrant blockchain sector can emerge across the electricity value chain, with each new piece of smart contract functionality complementing and adding value to the entire ecosystem. Funding Agency: *Science Foundation of Ireland (SFI), Government of Ireland*. Principle Investigator: *Dr. Paul Cuffe, Assistant Professor, School of EEE, University College Dublin, Ireland*.

2017 – 2021 **Investigations on the framework of the transactive energy market for residential community microgrid.** This work presents a framework of the transactive energy market (TEM) for a residential community microgrid with proactive consumers as market participants for optimal power management with peer-to-peer (P2P) power trading and demand response under the smart grid environment. The participants in the marketplace are encouraged to trade their net demand with the neighborhood besides the upstream utility through a transactive energy market operator (TEMO). The TEMO is a non-profited retail manager; it aims to enable prosumers to participate in the TEM and maintain the real-time balance between local generation and demand. Funding agency: *Ministry of electronics and information technology (MEITY), Government of India*. Principle Investigator: *Dr. Selvan M.P., Professor, Dept. of EEE, NIT Tiruchirappalli, India*.

Research Publications (CIF=30)

Journal Articles

1. Acharya, R. M., Vishak, A., **Hanumantha Rao Bokkisam**, Singh, S., & M.P., S. (2023). Privacy-preserving e-market for v2v bilateral energy trading with social welfare maximization. *IEEE Transactions on Vehicular Technology (Under Review)*.

2. Arun, S., Bingi, K., Vijaya Priya, R., Jacob Raglend, I., **Hanumantha Rao Bokkisam** et al. (2023). Novel architecture for transactive energy management systems with various market clearing strategies. *Mathematical Problems in Engineering, 2023*.

3. **Hanumantha Rao Bokkisam**, Morstyn, T., & Cuffe, P. (2023). Structuring blockchain-based financial hedging instrument to mitigate electricity price risk using battery energy storage systems. *IEEE Transactions on Energy Markets, Policy and Regulation (Under Review)*.

4. **Hanumantha Rao Bokkisam**, Acharya, R. M., & M.P., S. (2022). Framework of transactive energy market pool for community energy trading and demand response management using an auction-theoretic approach. *International Journal of Electrical Power & Energy Systems*, *137*, 107719. doi:https://doi.org/10.1016/j.ijepes.2021.107719

5. **Hanumantha Rao Bokkisam**, Singh, S., Acharya, R. M., & Selvan, M. P. (2022). Blockchain-based peer-to-peer transactive energy system for community microgrid with demand response management. *CSEE Journal of Power and Energy Systems*, *8*(1), 198–211. doi:10.17775/CSEEJPES.2020.06660

6. Savelli, I., **Hanumantha Rao Bokkisam**, Cuffe, P., & Morstyn, T. (2022). On-demand energy flexibility market via smart contracts to help reduce balancing costs in great britain. *Energy Economics (Under Review)*.

7. Acharya, R. M., **Hanumantha Rao Bokkisam**, & Selvan, M. P. (2021). Aggregator free ancillary services e-market for electric vehicles using smart contracts. *International Transactions on Electrical Energy Systems*, *31*(11), e13096. doi:https://doi.org/10.1002/2050-7038.13096

8. **Hanumantha Rao Bokkisam**, & M.P., S. (2021). Effective community energy management through transactive energy marketplace. *Computers & Electrical Engineering*, *93*, 107312. doi:https://doi.org/10.1016/j.compeleceng.2021.107312

9. **Hanumantha Rao Bokkisam**, Arun, S. L., & Selvan, M. P. (2020). Framework of locality electricity trading system for profitable peer-to-peer power transaction in locality electricity market. *IET Smart Grid*, *3*(3), 318–330. doi:https://doi.org/10.1049/iet-stg.2019.0131

10. **Hanumantha Rao Bokkisam**, Arun, S. L., & Selvan, M. P. (2019). An electric power trading framework for smart residential community in smart cities. *IET Smart Cities*, *1*(2), 40–51. doi:https://doi.org/10.1049/iet-smc.2019.0055

Conference Proceedings

1. Bird, B., **Hanumantha Rao Bokkisam**, Savelli, I., Morstyn, T., & Cuffe, P. (2023). Towards a blockchain implementation of a governance & revenue dispersal mechanism for investments in battery energy storage systems. In *Ieeepower tech 2023 (accepted for publication)*.

2. **Hanumantha Rao Bokkisam**, Savelli, I., Morstyn, T., & Cuffe, P. (2022). Towards a distributed autonomous organisation for financing, governing and disbursing revenues of a battery energy storage system. In *Ieee global emerging technology "get2022" blockchain forum (accepted for publication)*.

3. **Hanumantha Rao Bokkisam**, & P, S. M. (2020). Prosumer participation in a transactive energy marketplace: A game-theoretic approach. In *2020 ieee international power and renewable energy conference* (pp. 1–6). doi:10.1109/IPRECON49514.2020.9315274

4 **Hanumantha Rao Bokkisam**, Chandan Kumar, B., Manjunatha Sharma, K., & Selvan, M. P. (2018). Design and development of an emulator for distribution automation using dcs. In *2018 20th national power systems conference (npsc)* (pp. 1–6). doi:10.1109/NPSC.2018.8771724

5 Krishnan, N., **Hanumantha Rao Bokkisam**, Arun, S., & Selvan, M. (2018). Interactive demand response in a locality of smart power system. In *2018 20th national power systems conference (npsc)* (pp. 1–6). doi:10.1109/NPSC.2018.8771731

Core Competencies

Electrical Softwares	MATLAB, E-TAP, Power World Simulator, PSCAD, Power Factory Homer Pro, PVSyst.
Programming Languages	MATLAB, C, C^{++}, JavaScript, Python, and Solidity.
Operating Systems	Windows, Linux.
Office Suits	Microsoft Office, PowerPoint, Excel, Outlook, and Keynote.
visualization tools	Excel, MS Visio, Inkscape, and Origin.
Documentation preparation	MS Word, LaTeX, and Overleaf.
Languages	English, Telugu, Tamil, and Hindi.

Miscellaneous

Fellowships

2021-23 **Science Foundation of Ireland (SFI) Postdoctoral Fellowship**, at University College Dublin, Ireland.

2017-21 **Visvesvaraya Ph.D. Fellowship**, MeitY, Govt. of India at NIT Trichy, India.

2011-13 **MHRD GATE Fellowship**, Govt. of India at NIT Karnataka, India.

Achievements

2021 Got the **Postdoctoral fellowship** funded by EPSRC (UK) & SFI (Ireland).

Got the **IEEE Madras Section's Publication Award**.

2018 Got the best paper **presenter** award at the NPSC-2018 in NIT Trichy, India.

2017 Got the **MeitY (DeitY) fellowship** during my Ph.D.

2013 Got the **570 GATE Score** with 3631 All India Rank.

2011 Got the **572 GATE Score** with 1171 All India Rank.

2010 Received **Institute Medal** for academic achievement as the best **Lecturer** in GPCET, A.P., India.

2008 Stood **Class first** in Bachelors at SKIT, Srikalahasti, A.P., India.

2001 Stood **Class first** in SSC at ZPHS Muchivolu (Vi), Srikalahasti, A.P., India.

Certifications/Online Courses

2022 From **Udemy: Blockchain and Solidity**.

2021 From **Oxford University Press: Research Integrity Training**.

From **Indian Smart Grid Forum (ISGF): Blockchain for Energy & Utilities**.

2020 From **DTU, Denmark: Renewables in electricity market**s.

From **IEEE Learning Network (ILN), USA: Consumer Participation in Electricity Markets**.

2029 From **Mathworks: MATLAB Programming, Machine Learning, Deep Learning, Statistical Methods, Matlab for Financial Applications**.

Miscellaneous (continued)

Seminar/ Conference/ Workshop attended

- 2022 Transactive Energy Theory Workshop: Workshop 3: TE Theory Derived Concepts and Demonstrations organized by PNNL, USA.
- Transactive Energy Theory Workshop: Workshop 2: Extracting DER Flexibility through Innovative Control and Economic Principles organized by PNNL, USA.
- Transactive Energy Theory Workshop: Workshop 1: Theory of Designing Customer Incentives under Changing Power System Paradigm organized by PNNL, USA.
- 2020 Energy Efficiency in Smart Buildings Through IoT Sensor Integration organized by IEEE, Hyderabad section, India.
- India Smart metering adoption organized by ISGF, India.
- Blockchain: Revolutionizing the world's economy organized by IEEE MADRAS YP Affinity Group & IEEE TEMS Madras Chapter, India.
- How a career in power and energy led me to humanitarian opportunities with the largest professional society in the world organized by IEEE YESIST12 & IEEE SSIT Madras Section.
- Technology-Driven Logistics and Supply Chain during COVID-19 organized by IEEE India Council.
- Reinforcement Learning and its applications organized by IEEE Student Branch, NIT Trichy.
- Renewable Energy Systems and Sustainability – Emerge of a Project Base organized by Muthayammal Engineering College, Tamilnadu, India.
- Blockchain Applications in the Electricity Sector organized by India Smart Grid Forum (ISGF) Asia Clean Energy Forum (ACEF), India.
- Blockchain and its applications organized by IEEE Student Branch, NIT Trichy, India.
- 2019 MeitY workshop organized by MeitY, Government of India, India.
- 2018 Design and development of an emulator for distribution automation using DCS organized NPSC 2018, organized by NIT Trichy, India.
- Interactive demand response in a locality of smart power systems organized NPSC 2018, organized by NIT Trichy, India.
- MATLAB training organized IEEE Student Branch, NIT Trichy, India.
- Introduction to IoT organized by IEEE Student Branch, NIT Trichy, India.

Co-Curricular Activities

- 2019-TD Reviewing technical articles for several International Journals (IEEE TSG, IEEE TI, IET SMC, IET GTD, IJPEDS, IJECE, Scientific Reports) & conferences (IJPEDS'21, IJCDS-2020, 3ICT2020, SRC20, IJAPE 2020, ECONF 2020, and IJAAS 2021, IEEE PEDAS 2022).
- 2018-21 Conducted several programs (STTPs, FDPs, and Workshops) under the banner of IEEE SB, NIT Trichy, India.
- 2019-21 Served as a **Treasurer** of IEEE Student Branch at NIT Trichy, India.
- 2019 Served as an **Executive Member** of IEEE Student Branch at NIT Trichy, India.
- Served as a **Finance committee member** of National Power Electronics Conference-2019, at NIT Trichy, T.N, India.
- 2018 Served as an **Executive Member** of IEEE Student Branch at NIT Trichy, India.
- Served as a **Program committee member** of National Power System Conference-2018, at NIT Trichy, T.N, India.

References

Dr. Paul Cuffe
Assistant Professor
School of EEE
University College Dublin
Ireland
☎ +353 877843796
✉ paul.cuffe@ucd.ie

Dr. M. P. Selvan
Professor
Department of EEE
National Institute of Technology
Tiruchirappalli-620015, India
☎ +91 9629930432
✉ selvanmp@nit.edu

Dr. S. Moorthi
Associate Professor
Department of EEE
National Institute of Technology
Tiruchirappalli-620015, India
☎ +91 8778121401
✉ srimoorthi@nit.edu