

Ashutosh Timilsina

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Education

- 2019–2023 **Ph.D., Computer Science**, *University of Kentucky*, Lexington, KY, *GPA 3.917/4.0*. Dissertation title: *Peer-to-Peer Energy Trading in Smart Residential Environment with User Behavioral Modeling*
- 2012–2016 **Bachelor of Engineering, Electrical Engineering**, *Tribhuvan University*, Institute of Engineering, Pulchowk Campus, Nepal, Graduated with First Division

Technical Skills

- Languages Python, C/C++, MATLAB, SQL, Lua
- Libraries Gurobi, NetworkX, SciPy, PyTorch, Keras, TensorFlow, MPI, OpenMP
- Software LaTeX, Dayzer, AutoCAD, ADS, PSpice, SolidWorks, MS Office, Adobe Suite

Research Interests

User Behavioral Modeling, eCommerce, Mathematical Optimization, Artificial Intelligence, Machine Learning, Reinforcement Learning, Computer Vision, Blockchain

Research and Work Experience

- June 2023 – Present **Energy Market Analyst**
Cambridge Energy Solutions, Cambridge, MA, USA
- Quality control of all changes and updates to the DAYZER, TRANZER and database models. Test the models of all combinations of inputs and confirm these are performing as intended.
 - Maintaining the market models and writing new scripts and update existing scripts using DZScript, specifically transmission system market models.
 - Maintaining the market models for several North American markets.
 - Tracking market changes in various ISOs/RTOs.
 - Assisting in the development of new market model features.
 - Testing, using, supporting and improving existing CES software products.
- Sep 2023 – Present **Advisor**
Power2Peer, MA, USA
- Advising executive team on developing strategies for company specializing on P2P energy trading and carbon trading using blockchain and machine learning models
 - Providing insights on market trends, regulatory considerations, and technological advancements in the dynamic landscape of P2P energy trading
 - Contributing with critical analyses and recommendations to help startup navigate challenges and capitalize on emerging opportunities.
- Aug. 2019 – May 2023 (3 years 10 months) **Graduate Research Assistant**
Cyber Physical Systems Lab – Under Dr. Simone Silvestri, University of Kentucky
- Designed and developed novel algorithms for P2P energy trading and Electric vehicle based spatial crowdsourcing platform, financial trading via blockchain

- Evaluation and analysis of algorithms including complexity & efficiency
- Formulated the solutions to complex problems using mathematical optimization, behavioral modeling, reinforcement learning & machine learning
- Implemented combinatorial multi-armed bandit-based task recommendation system and reverse auction mechanism
- Mentored undergraduate students on crowdsourcing & energy-sharing project

Apr. 2019 –
Aug. 2019
(5 months)

Electrical Engineer

Nilgiri Khola Hydropower Company Ltd., Kathmandu, Nepal.

- Managed design and implementation of large-scale hydroelectric project of 110 MW
- Collaborated with cross-functional teams of civil, mechanical engineers as well as financial officers and led electro-mechanical team
- Conducted site surveys to evaluate and optimize plant designs and prepared detailed project reports, and tender/bid documents
- Developed and maintained relationship with stakeholders, including government agencies, local communities, and project investors

May 2017 –
May 2019
(2 years)

Electrical Engineer

Mandu Hydropower Ltd., Kathmandu, Nepal.

- Led the design supervision and implementation of hydroelectric project of 22 MW
- Conducted research on new data-driven solutions to support integration of renewable energy into the grid and reduce energy waste
- Supervised design and installation of electro-mechanical equipment, transmission line, sub-station,
- Developed communication system using SCADA, data storage & retrieval, power distribution systems, and prepared electrical schematics
- Provided technical support for the installation and commissioning of the project
- Developed and maintained relationship with stakeholders, including government agencies, local communities, and project investors

Dec. 2016 –
May 2018
(1 year 6 months)

Technical Officer

H.I.F. Renewable Energy Ltd., Kathmandu, Nepal.

- Analyzed large datasets to identify patterns and trends in solar energy production and Consumption in Nepal
- Developed machine learning and predictive models for energy forecasting
- Manage the design and implementation of grid connected solar PV projects
- Performed technical and financial viability of PV projects
- Conducted site surveys to evaluate and optimize solar designs and prepared detailed project reports, and tender documents

Publications

- 2023 **e-Uber: A Crowdsourcing Platform for Electric Vehicle-based Ride- and Energy-sharing** ([link](#))
A. Timilsina and S. Silvestri, "e-Uber: A Crowdsourcing Platform for Electric Vehicle-based Ride- and Energy Sharing," *20th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2023)*, Toronto, Canada, 2023.
- 2023 **V2G Optimization for Dispatchable Residential Load Operation and Minimal Utility Cost** ([link](#))
R. Alden, A. Timilsina, S. Silvestri, D. Ionel, "V2G Optimization for Dispatchable Residential Load Operation and Minimal Utility Cost," *2023 IEEE Transportation Electrification Conference (ITEC)*, Michigan, USA, 2023.
- 2023 **P2P Energy Trading in a Smart Residential Environment with User Behavioral Modeling** ([link](#))
A. Timilsina, "P2P Energy Trading in a Smart Residential Environment with User Behavioral Modeling," *2023 IEEE Pervasive Computing Conference PerCom PhD Forum*, Georgia, USA, 2023.
- 2022 **P2P Energy Trading through Prospect Theory, Differential Evolution, and Reinforcement Learning** ([link](#))
A. Timilsina and S. Silvestri, "P2P Energy Trading through Prospect Theory, Differential Evolution, and Reinforcement Learning," *ACM Transactions on Evolutionary Learning and Optimization*, 2023.

- 2022 **Prospect Theory-inspired Automated P2P Energy Trading with Q-learning-based Dynamic Pricing ([link](#))**
A. Timilsina and S. Silvestri, "Prospect Theory-inspired Automated P2P Energy Trading with Q-learning-based Dynamic Pricing," *GLOBECOM 2022 - 2022 IEEE Global Communications Conference*, Rio de Janeiro, Brazil, 2022, pp. 4836-4841, doi: 10.1109/GLOBECOM48099.2022.10001173.
- 2021 **A Reinforcement Learning Approach for User Preference-aware Energy Sharing Systems ([link](#))**
A. Timilsina, A. R. Khamesi, V. Agate and S. Silvestri, "A Reinforcement Learning Approach for User Preference-Aware Energy Sharing Systems," in *IEEE Transactions on Green Communications and Networking*, vol. 5, no. 3, pp. 1138-1153, Sept. 2021, doi: 10.1109/TGCN.2021.3077854.
- 2019 **Comparative Analysis of Cell Balancing Topologies in Battery Management Systems ([link](#))**
A. Khanal, A. Timilsina, B. Paudyal, S. Ghimire, "Comparative analysis of Cell Balancing Topologies in Battery Management," *IoE Graduate Conference Summer Proceedings*, Kathmandu, Nepal, 2019.
- 2017 **Technical Design of a Grid-Connected Photovoltaic System and Its Challenges in Nepalese Power Scenario ([link](#))**
A. Timilsina and B. Paudyal, "Technical design of a grid-connected photovoltaic system and its challenges in Nepalese power scenario," *2017 7th International Conference on Power Systems (ICPS)*, Pune, India, 2017, pp. 334-339, doi: 10.1109/ICPES.2017.8387316.
- 2016 **A Novel Approach for Wireless Power Transfer using Magnetic Resonant Method ([link](#))**
A. Timilsina, B. Nepali, B. Paudyal et al, "A Novel Approach for Wireless Power Transfer using Magnetic Resonant Method," *OKRP Conference*, Kathmandu, Nepal, 2016.

Awards

- 2022 **Outstanding Student Paper Award – Winner**, Dept. of Computer Science, UKY
- 2022 **Member of the Year Award – Winner**, GSACS, University of Kentucky
- 2015 **LOCUS 2015: Electrical Project Competition - Winner**
- 2014 **LOCUS 2014: Electrical Project Competition - Appreciation**

Leadership & Volunteering Experience and Other Services

- June 2023 – **Qubit Nepal QNepal – *Founding Member***
- Oct. 2022 **International Conference on Network Protocols (ICNP'22) – *Volunteer***
- 2022–2023 **University of Kentucky Graduate Student Congress – *Representative***
Also serving in International Student Concern Committee
- 2022–2023 **Nepali Student Organization – *President***
- 2021–2022 **Nepali Student Organization – *Secretary***
- 2016 **Zerone Magazine and Zerone Scholar – *Editor and Author***
- 2014 – **Electrical Club – *Founding Member***
- 2012-2016 **LOCUS – *Volunteer and Participant***
- 43 citations and Peer-reviewed over 21 articles and journal papers**

Services as Peer-Reviewer

- 2019 **International Conference on Computing, Networking, and Communications (ICNC) – Network Algorithms and Performance Evaluation (NAPE)**
- 2020 **IEEE International Conference on Smart Computing (SmartComp)**
- 2021 **International Conference on Distributed Computing in Sensor systems (DCOSS'21)**
- 2021 **IEEE Global Communications Conference (GLOBECOM'21)**
- 2021 **17th International Conference on Wireless and Mobile Computing, Networking and Communications (WiMOB-SPPDT'21)**
- 2021 **14th International Conference on Communication and System and Networks (COMSNETS'22)**
- 2022 **IEEE Wireless Communications and Networking Conference (IEEE WCNC'22)**

- 2022 IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (IEEE WoWMoM'22)
- 2022 International Conference on Distributed Computing Systems (ICDCS'22)
- 2022 IEEE/ACM 30th International Symposium on Quality of Service (IWQoS'22)
- 2022 IEEE International Conference on Smart Computing (SMARTCOMP'22)
- 2022 Pervasive and Mobile Computing Journal
- 2022 IEEE Global Communications Conference (Globecom'22)
- 2022 IEEE International Conference on Sensing, Communication, and Networking (SECON'22)
- 2022 International Conference on Computing, Networking, and Communications (ICNC'23) – Network Algorithms and Performance Evaluation (NAPE)
- 2022 IEEE International Conference on Communications (ICC'23)
- 2023 IEEE Sensors Journal
- 2023 24th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)
- 2023 9th IEEE International Conference on Smart Computing (SMARTCOMP 2023)
- 2023 20th Annual IEEE International Conference on Sensing, Communication, and Networking (SECON)