Kingsley Etonwana Nweye

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Education

- **University of Texas at Austin** — Austin, TX, United States
  Ph.D. - Civil Engineering; GPA: 4.000/4.000 — *Aug 2021 - Present*
  M.S.E. - Civil Engineering; GPA: 4.000/4.000 — *Aug 2019 - Aug 2021*
  Courses: *Data Mining, Energy Simulation in Building Design, HVAC Design, Smart Buildings & Cities, Sustainable Building Design*
- **University of South Carolina** — Columbia, SC, United States
  B.S.E. - Mechanical Engineering; GPA: 3.858/4.000 (Magna Cum Laude) — *May 2013 - May 2017*
  Courses: *Algorithmic Design, Engineering Optimization, Engineering Ethics, Fluid Mechanics, Heat Transfer, Thermodynamics*

Skills Summary

- **Programming**: Bash, Java, LaTeX, MATLAB, Python, SQL, Swift
- **Tools**: AutoCAD, AWS, EnergyPlus, eQUEST, Firebase, Git, Grafana, Inventor, Jira, OpenStudio, Raspberry Pi, WinAM
- **Soft Skills**: Leadership, Public Speaking, Time Management, Writing

Experience

- **Utilities and Energy Management, University of Texas at Austin** — Austin, TX, United States
  Graduate Research Assistant — *Jan 2020 - Present*
  - **University of Texas Energy Hub**: Developed and maintained cloud architecture for the collection, storage and manipulation of data from over 1,000 utility meters and 200 buildings located on the university campus and micro-grid. The data were used to model energy and water consumption for the purposes of demand-side management, fault detection, project planning, billing, business intelligence and reporting. Tech: AWS (Athena, API Gateway, Lambda, QuickSight, RDS PostgreSQL, S3), Bash, Git, Jira, Python.
  - **Comfort Kiosk iOS Application**: Developed iPad application for thermal comfort polling to determine occupant indoor environment preferences and optimal HVAC zone set-point schedules. Tech: Google Firebase, Python, Swift.
  - **Building Energy Performance Modeling**: Developed and calibrated energy models for the evaluation of energy conservation measures in 3 existing buildings. Tech: WinAM.
  - **Maintenance**: Carried out HVAC control fault investigation in campus buildings using BAS infrastructure. Also, participated in on-site inspection of HVAC equipment to inform maintenance work orders.
- **Intelligent Environments Laboratory, University of Texas at Austin** — Austin, TX, United States
  Graduate Research Assistant — *Aug 2019 - Present*
  - **Reinforcement Learning for Building Energy Management**: Led the development of CityLearn Gym environment v1.1.0 - present and researched on the use of reinforcement learning control for demand response and grid-interactive building applications. Tech: Bash, EnergyPlus, Git, Grafana, OpenStudio, SQL, Python.
  - **Occupant-Centric Control**: Developed cost-effective framework for the estimation of occupancy counts by leveraging existing Wi-Fi infrastructure as well as estimation of energy savings from utilizing occupancy and smart meter data in HVAC equipment ramp-up and setback scheduling. Tech: EnergyPlus, Git, Python, WinAM.
  - **Publications**: First-authored 5 of 8 peer-reviewed full and poster papers. Tech: LaTeX.
  - **Mentorship**: Mentored 4 undergraduate and 2 graduate students in machine learning and building energy modeling projects.
- **Climate Change AI Summer School 2023, Climate Change AI** — Pittsburgh, PA, United States
  Independent Contractor — *Jun 2023 - Aug 2023*
  - **Tutoring**: Developed and taught a guided tutorial on reinforcement learning control for grid-interactive efficient buildings and communities in a virtual class of over ten students. Tech: Google CoLab, Python.
- **CAEE Department, University of Texas at Austin** — Austin, TX, United States
  Teaching Assistant; Elementary Mechanics of Fluids Laboratory — *Jan 2021 - May 2021*
  - **Tutoring**: Lectured and supervised a class of 30 undergraduate students on experiment procedures and graded laboratory exercises and reports.
  - **Evaluation**: Received "very good" or "excellent" overall rating from 80% of responses in an anonymous mid-semester survey that had a 50% return rate.
- **Ministry of Works and Infrastructure, Ondo State Government** — Akure, Ondo, Nigeria
  Secretary to the Deputy Director of Finance and Administration; N.Y.S.C. — *Mar 2018 - Dec 2018*
  - **Secretarial Services**: Prepared capital project files, memos and letters for endorsement by the ministry's Permanent Secretary and Commissioner approval by the state's Governor.
- **TotalEnergies E&P Nigeria Limited** — Port Harcourt, Rivers, Nigeria
  Maintenance Engineer Trainee — *Sep 2017 - Jan 2018*
  - **HVAC Maintenance**: Conducted routine maintenance on chillers, air handling units, direct expansion packaged systems, extractor fans and split air conditioners and prepared quotations for the mechanical and electrical part purchase orders.
- **McNAIR Center for Aerospace Innovation, University of South Carolina** — Columbia, SC, United States
  Undergraduate Research Assistant — *Aug 2016 - May 2017*

- **Characterization of non-conventional laminates**: Conducted tensile load testing on laminate coupons using MTS Hydraulic Testing System to investigate the mechanical properties of quasi-isotropic non-conventional composite laminate using ASTM 3039D guidelines.

- **Brookstone School Secondary** Port Harcourt, Rivers, Nigeria
  Head Boy *Sep 2012 - Jun 2013*
  - **Leadership**: Appointed on merit for achieving best May/June 2012 I.G.C.S.E. result. Coordinated daily school assembly and liaised with school administration on improvement of student welfare.

Projects

- **NEURIPS Competiton Track: The CityLearn Challenge (Supervised Learning, Reinforcement Learning)**: Developed CityLearn environment used in two editions of the challenge on AIcrowd where machine learning solutions were crowd-sourced from over 100 teams to optimize energy, thermal comfort, emissions and resilience objectives in grid-interactive communities. Tech: Git, Python. (Jul 2022 - Present)
- **Building Energy Intensity Toolchain (Big Data, Electrification, Decarbonization)**: Analyzed data from over 200 buildings, 6,000 equipment and 44,000 BAS points to develop a framework that provided insights on a building's sensor data quality, operational anomalies, energy performance and opportunities for electrification through heat pump adoption as well as, a dashboard for data visualization and exploration. Tech: EnergyPlus, Grafana, Python. (May 2022 - Jul 2022)
- **Intelligent Environments Laboratory COVID-19 Dashboard (Data Management, Analysis, Visualization)**: Designed and deployed a media-featured dashboard that provided a multifaceted view of the COVID-19 impact in Austin, TX using open-source and private public health, economic, transportation, air quality, energy, water and social data. Tech: Git, Python. (Mar 2020 - Present)
- **HVACLearn (Occupant-Centric Control, IoT)**: Developed source code an deployed in Raspberry Pis for indoor environment data collection and management in 19 office spaces to support Ph.D. work on occupant-centric control of thermostat set-points to balance comfort and energy efficiency. Tech: AWS (Lambda), Python, Raspberry Pi. (Aug 2019 - Mar 2021)
- **Alias Mob (Mobile Application Development, Event Management)**: Developed client and business side front-end solutions for iOS application that was used to manage club event booking and ticketing. Tech: Firebase, Swift, XCode. (Apr - Dec 2019)
- **Yefi (Mobile Application Development, Food Services)**: Developed iOS application that was deployed in the App Store which, provided users with general information on over 60 local restaurants and their menus. Tech: Android Studio, Firebase, Java, Swift, XCode. (Feb - Aug 2019)
- **Solar Boat Senior Design Project (Renewable Energy, Transportation)**: Improved existing vessel design by including boundary layers at areas of obstructed airflow to improve aerodynamics, installing 2 pairs of motors in parallel to improve torque. (Aug 2016 - May 2017)

Selected Publications

- Kingsley Nweye, Siva Sankaranarayanan, and Zoltan Nagy. "MERLIN: Multi-agent offline and transfer learning for occupant-centric operation of grid-interactive communities". en. In: *Applied Energy* 346 (Sept. 2023), p. 121323. ISSN: 0306-2619
- Zoltan Nagy, Gregor Henze, Sourav Dey, Javier Arroyo, Lieve Helsen, Xiangyu Zhang, Bingqing Chen, Kadir Amasyali, Kuldeep Kurte, Ahmed Zamzam, Helia Zandi, Ján Drgoňa, Matias Quintana, Steven McCullogh, June Young Park, Han Li, Tianzhen Hong, Silvio Brandi, Giuseppe Pinto, Alfonso Capozzoli, Draguna Vrabie, Mario Bergés, Kingsley Nweye, Thibault Marzullo, and Andrey Bernstein. "Ten questions concerning reinforcement learning for building energy management". en. In: *Building and Environment* 241 (Aug. 2023), p. 110435. ISSN: 0360-1323
- Zoltan Nagy, Burak Gunay, Clayton Miller, Jakob Hahn, Mohamed Ouf, Seungjae Lee, Brodie W. Hobson, Tareq Abuimara, Karol Bandurski, Maíra André, Clara-Larissa Lorenz, Sarah Crosby, Bing Dong, Zixin Jiang, Yuzhen Peng, Matteo Favero, June Young Park, Kingsley Nweye, Pedram Nojedehi, Helen Stopps, Lucile Sarran, Connor Brackley, Katherine Bassett, Krissy Govertsen, Nicole Koczorek, Oliver Abele, Emily Casavant, Michael Kane, Zheng O'Neill, Tao Yang, Julia Day, Brent Huchuk, Runa T. Hellwig, and Marika Vellei. "Ten questions concerning occupant-centric control and operations". en. In: *Building and Environment* (June 2023), p. 110518. ISSN: 0360-1323
- Aysegul Demir Dilsiz, Kingsley E. Nweye, Allen J. Wu, Jérôme H. Kämpf, Filip Biljecki, and Zoltan Nagy. "How spatio-temporal resolution impacts urban energy calibration". en. In: *Energy and Buildings* (May 2023), p. 113175. ISSN: 0378-7788
- Kingsley E Nweye, Allen Wu, Hyun Park, Yara Almilaify, and Zoltan Nagy. "CityLearn: A tutorial on reinforcement learning control for grid-interactive efficient buildings and communities". In: *ICLR 2023 workshop on tackling climate change with machine learning*. May 2023
- Ting-Yu Dai, Praveen Radhakrishnan, Kingsley Nweye, Robert Estrada, Dev Niyogi, and Zoltan Nagy. "Analyzing the impact of COVID-19 on the electricity demand in Austin, TX using an ensemble-model based counterfactual and 400,000 smart meters". en. In: *Computational Urban Science* 3.1 (May 2023), p. 20. ISSN: 2730-6852
- Han Li, Hicham Johra, Flavia de Andrade Pereira, Tianzhen Hong, Jérôme Le Dréau, Anthony Maturo, Mingjun Wei, Yapan Liu, Ali Saberi-Derakhtenjani, Zoltan Nagy, Anna Marszal-Pomianowska, Donal Finn, Shohei Miyata, Kathryn Kaspar, Kingsley Nweye, Zheng O'Neill, Fabiano Pallonetto, and Bing Dong. "Data-driven key performance indicators and datasets for building energy flexibility: A review and perspectives". en. In: *Applied Energy* 343 (Aug. 2023), p. 121217. ISSN: 0306-2619
- Kingsley Nweye, Zoltan Nagy, Sharada Mohanty, Dipam Chakraborty, Siva Sankaranarayanan, Tianzhen Hong, Sourav Dey, Gregor Henze, Jan Drgona, Fangquan Lin, Wei Jiang, Hanwei Zhang, Zhongkai Yi, Jihai Zhang, Cheng Yang, Matthew Motoki, Sorapong Khongnawang, Michael Ibrahim, Abilmansur Zhumabekov, Daniel May, Zhihu Yang, Xiaozhuang Song, Han Zhang, Xiaoning Dong, Shun Zheng, and Jiang Bian. "The CityLearn Challenge 2022: Overview, Results, and Lessons Learned". en. In: *Proceedings of the NeurIPS 2022 Competitions Track*. ISSN: 2640-3498. PMLR, Aug. 2022, pp. 85–103

- Kingsley Nweye, Bo Liu, Peter Stone, and Zoltan Nagy. "Real-world challenges for multi-agent reinforcement learning in grid-interactive buildings". In: *Energy and AI* 10 (2022), p. 100202
- Hagen Fritz, Sepehr Bastami, Calvin Lin, Kingsley Nweye, Tung To, Lauren Chen, Dung Le, Angelina Ibarra, Wendy Zhang, June Young Park, William Waites, Mengjia Tang, Pawel Misztal, Atila Novoselac, Edison Thomaz, Kerry Kinney, and Zoltan Nagy. "Design, fabrication, and calibration of the Building EnVironment and Occupancy (BEVO) Beacon: A rapidly-deployable and affordable indoor environmental quality monitor". In: *Building and Environment* 222 (Aug. 2022), p. 109432. ISSN: 0360-1323
- Lauryn A. Spearing, Kingsley Nweye, Helena R. Tiedmann, Zoltan Nagy, Lina Sela, and Kasey M. Faust. "Water Demand and Human Behavior during Compounding Disasters: The Case of Winter Storm Uri and the COVID-19 Pandemic". en. In: (June 2022). Publisher: American Society of Civil Engineers, pp. 746–754
- Kingsley Nweye, Zoltan Nagy, Bo Liu, and Peter Stone. "Offline training of multi-agent reinforcement agents for grid-interactive buildings control". In: *Proceedings of the Thirteenth ACM International Conference on Future Energy Systems*. e-Energy '22. New York, NY, USA: Association for Computing Machinery, June 2022, pp. 442–443. ISBN: 978-1-4503-9397-3
- Kingsley Nweye and Zoltan Nagy. "MARTINI: Smart meter driven estimation of HVAC schedules and energy savings based on Wi-Fi sensing and clustering". In: *Applied Energy* 316 (June 2022), p. 118980. ISSN: 0306-2619
- June Young Park, Kingsley Nweye, Edward Mbata, and Zoltan Nagy. "CROOD: Estimating crude building occupancy from mobile device connections without ground-truth calibration". In: *Building and Environment* 216 (May 2022), p. 109040. ISSN: 0360-1323
- Kingsley Nweye and Zoltan Nagy. "Impact of COVID-19 on Academic Campus Energy Use". In: *Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*. BuildSys '20. New York, NY, USA: Association for Computing Machinery, Nov. 2020, pp. 322–323. ISBN: 978-1-4503-8061-4
- Kingsley Nweye and Zoltan Nagy. "HVAC Scheduling based on Wi-Fi derived Occupancy". In: *Proceedings of the 7th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation*. BuildSys '20. New York, NY, USA: Association for Computing Machinery, Nov. 2020, pp. 340–341. ISBN: 978-1-4503-8061-4

Awards

- Third place in Technical Demonstration category and $5,000 award for "Building Energy Intensity Toolchain" team submission at Real Time Energy Management Global Energy and Building Hackathon by New York State Energy Research Development Agency. (Jul 2022)

Activities

- **Graduate Student Guest Editor of IET Renewable Power Generation Journal** — Remote
  Selected reviewers and managed peer-review process for submissions to journal's special issue. — *May 2023 - Present*
- **Webmaster of ACM SIGEnergy RLEM Workshop** — Virtual
  Designed and maintained workshop website using a Jekyll and GitHub Actions workflow. — *Nov 2022 - Present*
- **Co-President of TexASHRAE** — Austin, TX, United States
  Facilitated networking opportunities between local MEP professionals and students. — *Aug 2021 - Aug 2023*
- **Participant in IEA EBC Annex 81** — Virtual
  Contributed to review of data-driven energy flexibility KPIs for building-to-grid applications. — *Aug 2021 - Present*
- **Participant in IEA EBC Annex 79** — Virtual
  Presented work on and contributed to discussions on occupant-centric building control. — *Apr 2020 - Present*
- **Volunteer at UT Girl Day** — Austin, TX, USA
  Hosted a session and taught young girls how to build paper "bunny copters". — *Feb 2021*
- **Member of Amadi Flats Fitness Club** — Port Harcourt, Rivers, Nigeria
  Participated in group running, aerobic and strength training exercise events. — *May 2017 - Feb 2018*
- **Member of Pan-African Student Association** — Columbia, SC, USA
  Provided technical support during annual organization event. — *May 2013 - May 2017*

Interests and Hobbies

- DJ'ing, Flight simulator, LEGO, Paintball, Running, Soccer, Weightlifting.