

# Nathan David Obeng-Amoako, E.I.T.

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## RESEARCH INTERESTS

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- Intelligent Transportation Systems
- Advanced Traffic Signal Control
- Machine Learning and Deep Learning
- Transportation Demand Forecasting
- Transit Operations and Management
- Bicycle and Pedestrian Transportation

## EDUCATION

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**Doctor of Philosophy in Civil Engineering (Transportation)** Sep 2023 - Present

Northeastern University, Boston, MA (GPA: 4.00/4.00)

**Research Advisor:** Professor Peter Furth

**Master of Science in Civil Engineering (Transportation)**

Sep 2023 – Apr 2025

Northeastern University, Boston, MA (GPA: 4.00/4.00)

**Bachelor of Science in Civil Engineering**

Aug 2018 - Sep 2022

Kwame Nkrumah University of Science and Technology (KNUST), Kumasi

**Recognition:** Best Graduating Student, Class of 2022

## RESEARCH EXPERIENCE

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**Graduate Research Assistant, Northeastern University, Boston, MA** Sep 2023 - Present

- Development of advanced traffic signal controls and simulations
- Investigation of barriers to low-stress bicycle network connectivity

**Research Assistant, Civil Engineering Department, KNUST**

Jan 2022 - Sep 2022

- Empirical investigation of aggregate retention benefits of waste-modified asphalt
- Analysis of mechanical and durability properties of asphalt mixtures

## SPONSORED RESEARCH PROJECTS

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**Project:** Bicycle Level of Traffic Stress at Intersections (xLTS)

Jun 2024 – Present

**Funding Agency:** United States Department of Transportation (USDOT)

- Assessing the impact of high-stress crossings on bike network connectivity
- Developing algorithms and data structures for traffic stress network analysis

**Project:** Accessible Bus Stop Design in the Presence of Bike Lanes

Sep 2023 – Jun 2024

**Funding Agency:** Massachusetts Department of Transportation (MassDOT)

- Studied bus rider and bicyclist behavior at floating and constrained bus stops
- Proposed design improvements to reduce bus-rider-and-bicyclist conflicts

## JOURNAL PUBLICATIONS

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- 2025      1. Joshua Kofi Asamoah, Blessing Agyei Kyem, **Nathan David Obeng-Amoako**, Armstrong Aboah, SAAM-ReflectNet: Sign-Aware Attention-Based Multitasking Framework for Integrated Traffic Sign Detection and Retroreflectivity Estimation, *Expert Systems With Applications* (2025), doi: <https://doi.org/10.1016/j.eswa.2025.128003>

## Submitted and under review:

- 2025      2. Peter Furth, Ray Saeidi-Razavi, **Nathan David Obeng-Amoako** and Milad Tahmasebi. TSP-Friendly Underlying Traffic Signal Control, An Essential Complement of Transit Signal Priority. *IEEE Transactions on Intelligent Transportation Systems*.

## RESEARCH REPORTS

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- 2024      1. Eleni Christofa, Chengbo Ai, Peter Furth, Yu-Min Yang, Dewan Tanvir Ahammed, and **Nathan David Obeng-Amoako**. (2024). *Accessible Bus Stop Design in the Presence of Bike Lanes*. Massachusetts Department of Transportation (MassDOT), Office of Transportation Planning. Report No. 24-060.

## CONFERENCE PRESENTATIONS

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- 2025      1. Yu-Min (Thomas) Yanga, Dewan Tanvir Ahammed, **Nathan David Obeng-Amoako**, Eleni Christofa, Chengbo Ai, and Peter Furth. Design Guidelines for Accessible Floating Bus Stops. *International Conference on Transportation and Development 2025, ASCE*, Glendale, AZ.
- 2024      2. Yu-Min (Thomas) Yanga, Dewan Tanvir Ahammed, **Nathan David Obeng-Amoako**, Eleni Christofa, Chengbo Ai, and Peter Furth. (April 2024). Accessible Bus Stop Design in the Presence of Bike Lanes. Poster. *2024 MassDOT Transportation Innovation Conference*, Worcester, MA.
- 2023      3. **Nathan David Obeng-Amoako**, Arthur Louis Senaya, Bundu Kassim, Francisca Owusu-Ansah, Eugene Damoah, Santus Worclachie, and Kenneth A. Tutu. (April 2023). Modification of Bitumen with Waste Materials for Enhanced Aggregate Retention in Surface-Dressed Roads. *Lectern. 3rd IRF Africa Regional Congress & Exhibition*, Accra, Ghana.

## JOURNAL REVIEWS

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1. Transportation Research Board

Aug 2024 – Present

## SELECTED GRADUATE-LEVEL TERM PAPERS

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- Spring 2025      **Performance Evaluation of Emerging and Traditional Bus Transit Systems**  
This project compared Fixed Route, Fixed Route with Deviation, and Demand Responsive Transit systems using a simulation model developed in Python to evaluate performance metrics like waiting time, ridership, and unserved demand under varying conditions.
- Fall 2024      **Assessing the Impact of Electric Bikes on Urban Mobility in Boston**  
Analyzed Greater Boston's Bluebikes data to evaluate the impact of electric bicycles on mode choice and urban transportation dynamics. Applied statistical models to assess changes in demand for public bike-sharing systems.
- XGBoost-Driven Demand Prediction for Optimized Electric Vehicle Charging**  
Developed an integrated framework combining predictive modeling and optimization techniques to enhance the efficiency of electric vehicle charging infrastructure, leveraging the Adaptive Charging Network dataset from Caltech.

## TEACHING EXPERIENCE

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### Northeastern University, Boston, MA

- Summers of 2024, 2025      **Teaching Assistant, Sustainable Transportation Summer School Program**  
Location: Technische Universiteit Delft, The Netherlands
- Facilitate logistical, academic and evaluative support for an intensive 5-week program
  - Assist in teaching Vision Zero safety principles to 25 students
  - Explore strategies for car-free and car-lite zones to enhance active transportation
- Fall 2024      **Graduate Teaching Assistant, Statics and Solid Mechanics**
- Tutored fundamental concepts of Newtonian physics and solid mechanics
  - Evaluated students' test performance and offered comprehensive feedback

### Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

- Spring 2022      **Teaching Assistant, Irrigation & Drainage Engineering**
- Activity-oriented instruction of drainage design using *Autodesk Civil 3D*®
  - Development of course outlines and preparation of lecture materials

## HONOURS AND AWARDS

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- Civil and Environmental Engineering Distinguished Fellowship Award **Aug 2023**
- Associated Consultants Ltd. Award for Best Graduating Student, KNUST **Jul 2023**
- Provost Award for Excellent Students in College of Engineering, KNUST (**4 times**) **2019 - 2022**
- Provost Award for Excellent Students in College of Engineering, KNUST (**4 times**) **2019 – 2022**
- Academic Excellence Award, Ghana Engineering Students' Association, Ghana **Sep 2022**
- Global Finalist, Unilever Future Leaders League Business Pitch Competition, U.K. **Jul 2022**
- Scholar, Tullow Oil Scholarship Scheme, Ghana **Apr 2019**
- Semifinalist, National Science and Maths Quiz (NSMQ), Ghana **Jul 2018**

## PROFESSIONAL EXPERIENCE

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|---|---------------------|
| • Assistant Civil Engineer, BHM Construction Int'l UK Ltd., Tema        | Nov 2022 – Jul 2023 |
| • Civil Engineering Trainee, China Henan Int'l Corporation Ltd., Kumasi | Sep 2021 - Dec 2021 |

## CERTIFICATIONS

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| • <b>Engineer-in-Training (EIT) certification (FE Civil)</b> – ( <a href="#">Verify</a> )<br>Massachusetts Board of Registration of Professional Engineers & Professional Land Surveyors | Sep 2024 |
| • <b>Basic Life Support (CPR &amp; AED) Provider</b> – ( <a href="#">Verify</a> )<br>American Heart Association  | Apr 2024 |

## RELEVANT SKILLS

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|------------------------------|--|
| • <b>Python, R, MATLAB</b>   | machine learning, deep learning, advanced data analysis                      |
| • <b>PTV Vissim/Vistro</b>   | traffic flow simulations, traffic signal analysis, traffic impact analysis   |
| • <b>Synchro</b>             | traffic flow modeling, traffic signal timing optimization                    |
| • <b>ArcGIS, QGIS</b>        | mapping, visualizing and analyzing spatial data for informed decision making |
| • <b>AutoCAD</b>             | precision drafting and technical drawings, 2D and 3D des                     |
| • <b>HTML/CSS/JavaScript</b> | developing web applications  |
| • <b>Minitab, MS Excel</b>   | data visualization, statistical computing, data organization                 |

## SELECTED NEWS AND PRESS

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1. College of Engineering, Northeastern University. (August 2024). “PhD Student Reflects on the Sustainable Transportation Dialogue of Civilizations in Holland.” <https://coe.northeastern.edu/news/a-reflection-on-the-sustainable-transportation-dialogue-of-civilizations-course-in-holland/>
  2. Twitter. (June 2024). “Transit-friendly traffic signal timing can reduce MBTA Bus 39 delay by 90% at two intersections” by Peter Furth. <https://x.com/PeterFurth/status/1801694153098858812>

## PROFESSIONAL MEMBERSHIP

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|---|--------------------|
| • American Society of Civil Engineers (ASCE)                | Feb 2025 – Present |
| • Boston Society of Civil Engineers Section (BSCES) of ASCE | Feb 2025 – Present |
| • New England Intelligent Transportation Society (NEITS)    | Sep 2023 - Present |
| • Institute of Transportation Engineers (ITE)               | Jan 2024 – Present |

## LEADERSHIP EXPERIENCE

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|---|--------------------|
| <b>Department Rep., College of Engineering. PhD Council, Northeastern Univ.</b> | Jun 2024 – Present |
| • Meeting with advisor to discuss novel ways of improving student experience    |                    |
| • Organizing weekly coffee hours and semesterly happy hours for PhD students    |                    |

## LEADERSHIP EXPERIENCE (cont'd)

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### **Executive C'ttee Member, CEE Graduate Student Council, Northeastern Univ.**

- Brainstorming and implementing strategies to enhance graduate student experience
  - Serving as a liaison between the departmental chair and the graduate student body
- Feb 2024 – Present**

### **Communications Director, Young Professionals and Youth Coalition, Ghana**

**Jan 2021 - Dec 2021**

- Social media management to curate consistent communications content
- Organization of in-person and virtual engagements with members and partners

### **President, Civil Engineering Students' Association, KNUST**

**Feb 2020 - Sep 2021**

- Coordination of fundraising events to secure administrative equipment
- Establishment of academic support scheme for underachieving students

## VOLUNTEER EXPERIENCE & COMMUNITY INVOLVEMENT

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- **Judge**, Massachusetts Science and Engineering Fair, Worcester (April 2025)
- **Cycling Activist**, Boston Cycling Union, Boston, MA (Feb 2025 – Present)
- **Executive Vice President**, Student Energy Society, KNUST (Jan 2022 – Oct 2022)
- **Community Outreach Coordinator**, Nat'l Society of Black Engineers, KNUST (Jan 2022 – Sep 2022)
- **Project Coordinator**, Engineers Without Borders, KNUST (Aug 2021 - Jul 2022)

## REFERENCES

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*Available upon request*