

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

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## RESEARCH INTERESTS

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Intelligent Transportation Systems, Machine Learning, Transportation Safety, Advanced Traffic Signal Control, Bicycle and Pedestrian Transportation, Transit Operations and Management, Transportation Demand Forecasting.

## 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 - Present

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

- Building advanced traffic signal controls and simulations
- Assessment of the accessibility of public transit infrastructure
- Investigation of barriers to low-stress bicycle network connectivity

**Research Assistant, Dr. Tutu's Lab, Civil Engineering Dept., KNUST** Jan 2022 - Sep 2022

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

## RESEARCH PROJECTS

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**Project:** Bicycle Level of Traffic Stress at Intersections Jun 2024 – Present

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

- Investigating how detrimental high-stress crossings are to overall bike network connectivity
- Developing LTS criteria to evaluate the comfort level of cyclists on various road types

**Project:** Accessible Bus Stop Design in the Presence of Bike Lanes Sep 2023 – Jun 2024

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

- Investigated bus rider and bicyclist behavior and interactions at floating and constrained bus stops.
- Proposed design improvements and guidance to mitigate conflicts between bus riders and bicyclists.

## PUBLICATIONS

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### Submitted and under peer review:

1. P. Furth, R. Saeidi-Razavi, **N. D. Obeng-Amoako** and M. Tahmasebi. TSP-Friendly Underlying Traffic Signal Control, An Essential Complement of Transit Signal Priority. *IEEE Transactions on Intelligent Transportation Systems*.
2. J. K. Asamoah, B. A. Kyem, **N. D. Obeng-Amoako** and A. Aboah. SAAM-ReflectNet: Sign-Aware Attention-Based Multitasking Framework for Integrated Traffic Sign Detection and Retroreflectivity Estimation. *Expert Systems With Applications*.

### Drafted and under internal review:

3. **N. D. Obeng-Amoako**, K. A. Tutu, A. L. Senaya, B. N. Kassim, F. Owusu-Ansah, E. Damoah, and S. Worclachie. Modification of Bitumen with Waste Materials for Enhanced Aggregate Retention in Chip Seal Roads. Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

## CONFERENCE PRESENTATIONS

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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.
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.
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.

## RESEARCH REPORTS

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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.

## JOURNAL REVIEWS

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1. Transportation Research Board Annual Meeting, Washington, D.C. **Aug 2024 – Present**

## SELECTED GRADUATE-LEVEL TERM PAPERS

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**Engineering Probability and Statistics (IE 6200)** – Northeastern University, Fall 2024

**Topic: Assessing the Impact of Electric Bikes on Urban Mobility: A Case Study of Boston's Bluebikes**

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.

**Transportation Demand Forecasting and Model Estimation (CIVE 7381)** – Northeastern University, Fall 2024

**XGBoost-Driven Demand Prediction for Optimized Electric Vehicle Charging Recommendations**

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, containing extensive charging session logs and other relevant data at three sites.

## TEACHING EXPERIENCE

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**Northeastern University, Boston, MA**

**1. Summer School Program Assistant (Sustainable Transportation)** **Jun 2024 - Present**

Location: Technische Universiteit Delft, The Netherlands

- Assist in teaching Vision Zero traffic safety principles and safe road/intersection design
- Discuss high-quality transit service planning and traffic-circulation policies
- Explore strategies for car-free and car-lite zones to enhance active transportation

**2. Graduate Teaching Assistant (Statics and Solid Mechanics)** **Sep 2023 – Dec 2023**

- Tutored fundamental concepts of Newtonian physics to practical applications in solid mechanics
- Evaluated student performance by grading assignments and offering detailed feedback

**Principal GRE/SAT Tutor, G-S Educational Consult, Kumasi**

**Aug 2021 - Oct 2022**

- Engaged prospective GRE test-takers in high-level cognitive activity
- Facilitated differentiated instruction for GRE and SAT students

**Teaching Assistant, Irrigation & Drainage Engineering, KNUST**

**Jan 2022 - May 2022**

- Activity-oriented instruction of drainage design using *Autodesk Civil 3D*®
- Development of course outlines and preparation of lecture materials

## CERTIFICATIONS

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**Engineer-in-Training (EIT) certification (FE Civil) – ([Verify](#))** **Sep 2024**

Massachusetts Board of Registration of Professional Engineers and Professional Land Surveyors

**Basic Life Support (CPR & AED) Provider – ([Verify](#))**

American Heart Association

**Apr 2024**

## HONOURS AND AWARDS

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| • Associated Consultants Ltd. Award for Best Graduating Student, KNUST             | <b>Jul 2023</b>    |
| • Provost Award for the Best Student in College of Engineering, KNUST (4 times)    | <b>2019 - 2022</b> |
| • Provost Award for Excellent Students in College of Engineering, KNUST (4 times)  | <b>2019 – 2022</b> |
| • Academic Excellence Award, Ghana Engineering Students' Association, Ghana        | <b>Sep 2022</b>    |
| • Global Finalist, Unilever Future Leaders League Business Pitch Competition, U.K. | <b>Jul 2022</b>    |
| • Finalist, African Climate Adaptation Innovation Challenge, Ghana                 | <b>Mar 2022</b>    |
| • Scholar, Tullow Oil Scholarship Scheme, Ghana                                    | <b>Apr 2019</b>    |
| • Semifinalist, National Science and Maths Quiz (NSMQ), Ghana                      | <b>Jul 2018</b>    |

## RELEVANT SKILLS

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

## PROFESSIONAL EXPERIENCE

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**Assistant Civil Engineer, BHM Construction Int'l UK Ltd., Tema** **Nov 2022 – Jul 2023**

- Investigation of traffic problems and recommendations to improve traffic flow/safety
- Evaluation of construction materials for compliance with environmental standards

**Civil Engineering Trainee, China Henan Int'l Corporation Ltd., Kumasi** **Sep 2021 - Dec 2021**

- Construction quality control and monitoring through hands-on lab experiments
- Safety protocol compliance assessment at construction site of a 12 km urban highway

## 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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| • New England Intelligent Transportation Society (NEITS) | <b>Sep 2023 - Present</b> |
| • Institute of Transportation Engineers (ITE)            | <b>Jan 2024 – Present</b> |

## LEADERSHIP EXPERIENCE

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**Department Rep., College of Engineering, PhD Council, Northeastern Univ.** Jun 2024 – Present

- Meeting with advisor to discuss new ways of improving the PhD experience
- Organizing weekly coffee hours and semesterly happy hours for PhD students

**Executive C'ttee Member, CEE Graduate Student Council, Northeastern Univ.** Feb 2024 – Present

- Developing and implementing strategic plans to enhance graduate student experience
- Serving as a liaison between the departmental chair and the graduate student body

**Executive Vice President, Student Energy Society, KNUST** Jan 2022 – Oct 2022

- Portfolio progress tracking on timelines and performance metrics in strategic plan
- Participation in global meetings to report on the completion of deliverables

**Team Lead, Senior Capstone Design Project, KNUST** Jan 2021 - May 2022

- Effective prioritization of project tasks leading to successful project completion
- Periodic scheduling of project meeting with teammates to discuss work progress

**Project Coordinator, Engineers Without Borders, KNUST** Aug 2021 - Jul 2022

- Development and management of association's records in online database
- Supervision of the structural design of a footbridge for a deprived village called Ullo

**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

## REFERENCES

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*Available upon request*