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Armstrong Aboah, Ph.D.

Assistant Professor

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EDUCATION

University of Missouri, Columbia, MO, USA
Doctor of Philosophy (Civil Engineering), Jan 2020 – Dec 2022

- Concentration in Computer Vision and Machine Learning ○ Dissertation: *AI-based framework for automatically extracting high-low features from NDS data to understand driver behavior*

Tennessee Technological University, Cookeville, USA
Master of Science, Aug 2018 – Dec 2019

- Concentration in Transportation Planning

Kwame Nkrumah University of S&T, Kumasi, Ghana
Bachelor of Science, Sep 2013 – July 2017

- Concentration in Structure Engineering

RESEARCH INTERESTS

- Transportation Planning
- Human Factors and Ergonomics
- Intelligent Transportation Systems
- Autonomous and Connected Vehicles
- Medical Image Analysis
- Digital Twins and Smart Cities
- Big Data Analytics in Transportation
- Travel demand modeling and forecasting
- Transportation and Traffic Safety Research
- Public Transportation
- Congestion Management
- Pavement and Asset Management

TEACHING INTEREST

- Transportation Planning
- Statics
- Traffic Safety
- Highway Design
- Travel Demand Modeling
- Pavement Design

ACADEMIC APPOINTMENTS

• **Assistant Professor**	North Dakota State University	Feb 2024-Present
• **Assistant Research Professor**	University of Arizona	Aug 2023-Jan 2024
• **Research Associate**	Northwestern University	Jan 2023-Aug 2023

PROFESSIONAL ACTIVITIES

• **Guest Editor**	Electronics (IF = 2.6)	Jan 2025-Present
• **Continuing Edu. Chair**	ASCE – North Dakota Chapter	Jun 2024-Present
• **Member**	Transportation and Development Institute	Jun 2024-Present
• **Member**	American Society of Civil Engineers (ASCE)	May 2024-Present
• **Member**	IEEE	Feb 2024-Present

RESEARCH

REFEREED JOURNAL PUBLICATIONS (* Student Supervised, [c] Corresponding author, [E] Equal)

1. Tran, D. Q., Jeon, Y., **Aboah, A.**, Bak, J., Park, M., & Park, S. (2025). Leveraging Semisupervised Learning for Domain Adaptation: Enhancing Safety at Construction Sites through Long-Tailed Object Detection. ***Journal of Construction Engineering and Management***, *151*(1), 04024190.
   Impact Factor (IF) = 4.8 SJR = Q1
2. Kyem, A. B.*, Asamoah, K. J., Huang, Y, & **Aboah, A.**[C] (2024). Weather-Adaptive Synthetic Data Generation for Enhanced Power Line Inspection Using StarGAN. ***IEEE Access***.
   Impact Factor (IF) = 3.4 SJR = Q1 Rank = # 1 [LINK]
3. Arthur, E., **Aboah, A.**[C], & Huang, Y. (2024). A Novel FHWA-Compliant Dataset for Granular Vehicle Detection and Classification. ***IEEE Access***.
   Impact Factor (IF) = 3.4 SJR = Q1 Rank = # 1 [LINK]
4. Duah, J. O.*, **Aboah, A.**[C], & Osafo-Gyamfi, S. (2024). *DivNEDS: Diverse Naturalistic Edge Driving Scene Dataset for Autonomous Vehicle Scene Understanding*. ***IEEE Access***.
   Impact Factor (IF) = 3.4 SJR = Q1 Rank = # 1 [LINK]
5. Zhang, L., Yu, X., **Aboah, A.,** & Adu-Gyamfi, Y. (2024). 3D Object Detection and High-Resolution Traffic Parameters Extraction Using Low-Resolution LiDAR Data. ***ASCE Journal of Transportation Research Part A***.
   Impact Factor (IF) = 1.8 SJR = Q2
6. Owor, N. J.*, Adu-Gyamfi, Y., **Aboah, A.**[C], & Amo-Boateng, M. (2024). PaveSAM–segment anything for pavement distress. ***Road Materials and Pavement Design***, 1-25.
   Impact Factor (IF) = 3.4 SJR = Q1

REFEREED CONFERENCE PUBLICATIONS (* Student Supervised, [c] Corresponding author, [E] Equal)

1. Kyem, B. A.*, Denteh, E. K. O., Asamoah, J. K., **Aboah, A.**[C]. (2025). PaveCap: The First Multimodal Framework for Comprehensive Pavement Condition Assessment with Dense Captioning and PCI Estimation. ***104th Annual Meeting of the Transportation Research Board (TRB)*.**
2. Asamoah, J. K.*, Kyem, B. A., Ansarinejad, K., **Aboah, A.**[C]. (2025). A Novel Methodological Framework for Assessing Traffic Sign Retroreflectivity Using Lidar Data. ***104th Annual Meeting of the Transportation Research Board (TRB)***.
3. Tran, D. Q.[E], **Aboah, A.**[E], Jeon, Y., Shoman, M., Park, M., & Park, S. (2024). Low-Light Image Enhancement Framework for Improved Object Detection in Fisheye Lens Datasets. ***In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition***.
   Impact Factor (IF) = 63.1 Acceptance rate: 23.6% Rank = # 1
4. Shoman, M., Wang, D., **Aboah, A.**, & Abdel-Aty, M. (2024). Enhancing traffic safety with parallel dense video captioning for end-to-end event analysis. ***In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition***.
   Impact Factor (IF) = 63.1 Acceptance rate: 23.6% Rank = # 1

PROPOSAL WRITING

Winning Proposals

1. **Sponsor:** NSF Program: National Artificial Intelligence Research Resource Pilot (NAIRR)
   Title: "PRIME: A Foundational Predictive Real-time Intersection Monitoring Engine"
   Awarded Resources: TACC Frontera GPU: 10,000.0 Node Hours
   Contribution: Proposal Writer and PI
   Award Number: NAIRR240430
   Duration: Jan 2025 – December 2025
2. **Sponsor:** AI SUSTEIN - Seed Grant
   Title: "Advancing Power Grid Monitoring System: A Lightweight Deep Learning Framework for Real-Time Fault Detection and Continuous Smart Monitoring"
   Amount: $15,000
   Contribution: Proposal Writer and PI
   Award Number: FAR0038157
   Period: Aug 2024 - May 2025
3. **Sponsor:** EDRF Technology Acceleration Program - RCA
   Title: "Development of an IoT-Based Sensor for Advancing Safety Monitoring and Intervention at Work Zone Areas"
   Amount: $153,889
   Contribution: Proposal Writer and PI
   Award Number: FAR0037938
   Duration: Jun 2024 – May 2025
4. **Sponsor:** NDSU EXPLORE Undergraduate Research Program
   Title: "Advanced Traffic Sign Retro-reflectivity Condition Estimation Using Computer Vision"
   Amount: $2,400
   Contribution: Proposal Writer and PI
   Award Number: 000624
   Duration: Jun 2024 – August 2024

Other Proposals (pending)

5. Equipment: MRI: Track 2 Acquisition of a GPU-Accelerated Computing Cluster for Computationally Intensive and AI Research in North Dakota, Submitted to NSF. ***Amount: $3.8M*** **(Co-PI)**
6. MRI: Track # 1 Acquisition of PSV QTEC 3D-H Scanning Vibrometer, Submitted to NSF. ***Amount: $625,244*** **(Key Personnel)**
7. WheatSAM: Enhancing Wheat Disease Detection Through Zero-Shot Semantic Segmentation, Submitted to NIFA. ***Amount: $117,328*** **(PI)**
8. Development of multifunctional concrete using activated biochar derived from agricultural waste, Submitted to NIFA. ***Amount: $649,534*** **(Co-PI)**
9. Using A Novel UNet and InSAR Data for Continuous Monitoring of Ground Deformation and Performance Tracking of Geotechnical Assets, Submitted to MNDOT. ***Amount: $81,350*** (**PI)**
10. Long-Term Impacts of Speed Limit Reductions on Urban Road Safety in Minnesota, Submitted to MNDOT. ***Amount: $144,170*** (**PI)**
11. Analyzing Qualitative Public Input Data Using an Efficient Natural Language Processing Technique, Submitted to MNDOT. ***Amount: $91,200*** (**PI**)
12. BisonGuard: Revolutionizing Bison Management with UAVs, LiDAR, and AI for Sustainable Agriculture, Submitted to USDA. ***Amount: $489,355*** (**PI**)