Brandon Oubre, Ph.D.

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Research Interests

Mobile health and health informatics, with a focus on digital, quantitative behavioral assessment of neurologic disease signs.

Professional Experience

University of Alabama at Birmingham Department of Computer Science — *Birmingham, Alabama*
Assistant Professor — *Aug. 2024 – Present*

Harvard Medical School, Massachusetts General Hospital — *Boston, Massachusetts*
Research Fellow in Neurology (PI: Dr. Anoopum S. Gupta) — *Sept. 2022 – Aug. 2024*

UMass Amherst Manning College of Information and Computer Sciences — *Amherst, Massachusetts*
Ph.D. Student (Advised by Prof. Sunghoon Ivan Lee) — *Sept. 2017 – Aug. 2022*

Biogen Digital Health — *Cambridge, Massachusetts*
Research Intern: Movement Data Analyst — *June 2021 – Aug. 2021*

CenturyLink — *Monroe, Louisiana*
Software Developer II — *June 2015 – Aug. 2017*

NASA Johnson Space Center — *Houston, Texas*
Software Engineering Intern — *May 2014 – July 2014*

NASA Ames Research Center — *Mountain View, California*
Software Engineering Intern — *June 2013 – Aug. 2013*

Education

University of Massachusetts Amherst — *Amherst, Massachusetts*
PhD Computer Science Outstanding Dissertation Award — *September 2022*

University of Massachusetts Amherst — *Amherst, Massachusetts*
MS Computer Science — *May 2020*

Louisiana State University — *Baton Rouge, Louisiana*
BS Computer Science and BS Mathematics — *May 2015*

Honors and Awards

2024 **Outstanding Service Award**, IEEE EMBS Body Sensor Networks (BSN)
2024 **Featured Article**, IEEE Journal of Biomedical and Health Informatics
2022 **Outstanding Dissertation Award**, Manning College of Information and Computer Sciences
2022 **Featured Article**, IEEE Transactions on Biomedical Engineering
2022 **Dissertation Writing Fellowship**, Manning College of Information and Computer Sciences
2020 **Featured Article**, IEEE Transactions on Neural Systems and Rehabilitation Engineering
2019 **NSF GRFP Honorable Mention**, NSF Graduate Research Fellowship Program
2019 **NSF Student Registration Award**, IEEE EMBS BHI/BSN
2017 **Graduate School Fellowship**, Manning College of Information and Computer Sciences
2017 **James Kurose Scholar**, Manning College of Information and Computer Sciences
2015 **Outstanding Thesis Award**, Louisiana State University Honors College
2015 **University Medalist**, Louisiana State University
2014 **Barry M. Goldwater Scholar**, Barry Goldwater Scholarship and Excellence in Education Foundation
2014 **Official State Commendation**, Louisiana Senate Resolution SR39
2013 **Clayton Engineering Excellence Award**, Louisiana State University College of Engineering
2011 **LA-STEM Research Scholarship**, Louisiana State University Office of Strategic Initiatives

Publications

Journal Publications

[J1] J. Lee, **B. Oubre**, J.-F. Daneault, C. D. Stephen, J. D. Schmahmann, A. S. Gupta, and S. I. Lee, "Contrastive learning model for wearable-based ataxia assessment," *medRxiv*, Mar. 2025. DOI: https://doi.org/10.1101/2025.02.28.25323114.

[J2] **B. Oubre**, F. Yang, A. Luddy, R. Manohar, N. N. Soja, C. D. Stephen, J. D. Schmahmann, D. Kulkarni, L. White, S. Patel, and A. S. Gupta, "Eye tracking during passage reading supports precise oculomotor assessment in ataxias," *medRxiv*, Jan. 2025. DOI: https://doi.org/10.1101/2025.01.13.25320487.

[J3] A. Nunes, S. Patel, **B. Oubre**, *et al.*, "Multimodal digital phenotyping of behavior in a neurology clinic: Development of the neurobooth platform and the first two years of data collection," *medRxiv*, Dec. 2024. DOI: https://doi.org/10.1101/2024.12.28.24319527.

[J4] K. Vattis, **B. Oubre**, A. C. Luddy, J. S. Ouillon, N. M. Eklund, C. D. Stephen, J. D. Schmahmann, A. S. Nunes, and A. S. Gupta, "Sensitive quantification of cerebellar speech abnormalities using deep learning models," *IEEE Access*, vol. 12, pp. 62 328–62 340, Apr. 2024.

[J5] **B. Oubre** and S. I. Lee, "Detection and assessment of point-to-point movements during functional activities using deep learning and kinematic analyses of the stroke-affected wrist," *IEEE J. Biomed. Health Inform.*, vol. 28, no. 2, pp. 1022–1030, Feb. 2024, **[Featured Article]**.

[J6] J.-F. Daneault, **B. Oubre**, J. G. V. Miranda, and S. I. Lee, "Understanding voluntary human movement variability through data-driven segmentation and clustering," *Frontiers Human Neurosci.*, vol. 17, Nov. 2023.

[J7] J. Lee, **B. Oubre**, J.-F. Daneault, S. I. Lee, and A. S. Gupta, "Estimation of ataxia severity in children with ataxia-telangiectasia using ankle-worn sensors," *J. Neurology*, Jul. 2023.

[J8] Y. Liu, **B. Oubre**, C. Duval, S. I. Lee, and J.-F. Daneault, "A kinematic data-driven approach to differentiate involuntary choreic movements in individuals with neurological conditions," *IEEE Trans. Biomed. Eng.*, vol. 69, no. 12, pp. 3784–3791, Dec. 2022.

[J9] J. Lee, **B. Oubre**, J.-F. Daneault, C. D. Stephen, J. D. Schmahmann, A. S. Gupta, and S. I. Lee, "Analysis of gait sub-movements to estimate ataxia severity using ankle inertial data," *IEEE Trans. Biomed. Eng.*, vol. 69, no. 7, pp. 2314–2323, Jul. 2022.

[J10] **B. Oubre**, S. Lane, S. Holmes, K. Boyer, and S. I. Lee, "Estimating ground reaction force and center of pressure using low-cost wearable devices," *IEEE Trans. Biomed. Eng.*, vol. 69, no. 4, pp. 1461–1468, Apr. 2022, **[Featured Article]**.

[J11] **B. Oubre**, J.-F. Daneault, K. Whritenour, N. C. Khan, C. D. Stephen, J. D. Schmahmann, S. I. Lee, and A. S. Gupta, "Decomposition of reaching movements enables detection and measurement of ataxia," *Cerebellum*, vol. 20, no. 6, pp. 811–822, Dec. 2021.

[J12] **B. Oubre**, J.-F. Daneault, K. Boyer, J. H. Kim, M. Jasim, P. Bonato, and S. I. Lee, "A simple low-cost wearable sensor for long-term ambulatory monitoring of knee joint kinematics," *IEEE Trans. Biomed. Eng.*, vol. 67, no. 12, pp. 3483–3490, Dec. 2020.

[J13] **B. Oubre**, J.-F. Daneault, H.-T. Jung, K. Whritenour, J. G. V. Miranda, J. Park, T. Ryu, Y. Kim, and S. I. Lee, "Estimating upper-limb impairment level in stroke survivors using wearable inertial sensors and a minimally-burdensome motor task," *IEEE Trans. Neural Syst. Rehabil. Eng.*, vol. 28, no. 3, pp. 601–611, Mar. 2020, **[Featured Article]**.

[J14] P. Khaloo, **B. Oubre**, J. Yang, T. Rahman, and S. I. Lee, "Nose: A novel odor sensing engine for ambient monitoring of the frying cooking method in kitchen environments," *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.*, vol. 3, no. 2, 49:1–49:25, Jun. 2019, ISSN: 2474-9567.

Conference Proceedings

[C1] **B. Oubre** and S. I. Lee, "Estimating post-stroke upper-limb impairment from four activities of daily living using a single wrist-worn inertial sensor," in *IEEE EMBS Int. Conf. Biomed. Health Inform.*, IEEE, Sep. 2022.

[C2] **B. Oubre**, J.-F. Daneault, H.-T. Jung, J. Park, T. Ryu, Y. Kim, and S. I. Lee, "Estimating quality of reaching movement using a wrist-worn inertial sensor," in *42nd Annu. Int. Conf. IEEE Eng. Medicine Biol. Soc.*, IEEE, Jul. 2020.

Abstracts, Talks, and Posters

[A1] **B. Oubre**, F. Yang, A. Luddy, R. Manohar, N. N. Soja, C. D. Stephen, J. D. Schmahmann, D. Kulkarni, L. White, S. Patel, and A. S. Gupta, "In-clinic eye tracking during passage reading supports precise assessment of oculomotor signs of ataxia," *Int. Congress for Ataxia Res.*, Nov. 2024, [Flash Talk].

[A2] **B. Oubre**, F. Yang, A. Luddy, R. Manohar, N. N. Soja, C. D. Stephen, J. D. Schmahmann, D. Kulkarni, L. White, S. Patel, and A. S. Gupta, "In-clinic eye tracking during passage reading supports precise assessment of oculomotor signs of ataxia," *21st IEEE Int. Conf. Wearable Implantable Body Sensor Netw.*, Oct. 2024.

[A3] **B. Oubre**, "Digital and quantitative behavioral phenotyping in neurologic disease," *ML4Health Seminar Series, Broad Institute*, Feb. 2024, [Invited Talk].

[A4] **B. Oubre**, J.-F. Daneault, K. Whritenour, N. C. Khan, C. D. Stephen, J. D. Schmahmann, S. I. Lee, and A. S. Gupta, "Decomposition of reaching movements enables detection and measurement of ataxia," *2nd Annu. Massachusetts General Hospital Ataxia Center Symp.*, May 2021, [Invited Talk].

[A5] **B. Oubre**, K. Whritenour, J.-F. Daneault, A. S. Gupta, and S. I. Lee, "Estimation of ataxia severity using wrist-worn sensors and the finger-to-nose test," *Nat. Ataxia Found. Ataxia Investigators Meeting*, Mar. 2020.

[A6] **B. Oubre**, K. Whritenour, J.-F. Daneault, A. S. Gupta, and S. I. Lee, "Estimation of ataxia severity using wrist-worn sensors and the finger-to-nose test," *1st Annu. Massachusetts General Hospital Ataxia Center Symp.*, Mar. 2020, [Invited Talk].

[A7] J. Yang, A. Varga, K. Tung, A. Chandra, **B. Oubre**, N. Ramasarma, E. K. Choe, P. Bonato, and S. I. Lee, "A finger-worn sensor network for monitoring the real-world performance of stroke survivors," *16th IEEE Int. Conf. Wearable Implantable Body Sensor Netw.*, May 2019.

Academic Service

Conference Organizing

2025 **Student Activities Chair**, IEEE EMBS Body Sensor Networks (BSN)
2025 **Clinical Abstracts Chair**, IEEE EMBS Body Sensor Networks (BSN)
2023–2024 **Publicity Chair**, IEEE EMBS Body Sensor Networks (BSN)

Editorial

2023–2025 **Associate Editor**, IEEE Int. Engineering in Medicine and Biology Conf. (EMBC)

Peer Review

IEEE JBHI, IEEE TNSRE, JNER, Footwear Sci., Sci. Reports, NPJ Parkinson's Disease, Sensors, Frontiers Bioeng. Biotechnol.

Teaching

CS 685/785: Foundations of Data Science *UAB*
Instructor *Spring 2025*

CS 350: Automata and Formal Languages *UAB*
Instructor *Fall 2024*

COMPSCI 590W / INFO 390W: Health Informatics and Data Science *UMass Amherst*
Teaching Assistant *Spring 2021–2022*

COMPSCI 240: Reasoning Under Uncertainty *UMass Amherst*
Lead Teaching Assistant *Fall 2021*
Teaching Assistant *Fall 2020*