Brandon **Oubre**

Research Fellow

boubre@mgh.harvard.edu | www.brandonoubre.com | brandonoubre | @br_oubre

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*

Experience

Harvard Medical School, Massachusetts General Hospital — *Boston, Massachusetts*
Research Fellow in Neurology — *Sept. 2022 – Present*

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

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

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

LSU Robotics Research Lab — *Baton Rouge, Louisiana*
Undergraduate Research (advised by Prof. Supratik Mukhopadhyay) — *May 2012 – May 2015*

NASA Johnson Space Center (Wearable Electronics Applications Research Lab) — *Houston, Texas*
Software Engineering Intern — *May 2014 – July 2014*

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

Honors and Awards

2022 **Outstanding Dissertation Award**, Manning College of Information and Computer Sciences
2022 **Featured Article**, IEEE Transactions on Biomedical Engineering
2022 **Dissertation Writing Fellowship**, UMass Amherst 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 BHI/BSN '19
2017 **Graduate School Fellowship**, UMass Amherst Manning College of Information and Computer Sciences
2017 **James Kurose Scholar**, UMass Amherst 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

Academic Service

2023 **Associate Editor**, IEEE Int. Engineering in Medicine and Biology Conference (EMBC)
2023 **Publicity Chair**, IEEE-EMBS Int. Conf. Wearable Implantable Body Sensor Netw. (BSN)

Publications

Journal Publications

[J1] 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.

[J2] 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.

[J3] **B. Oubre** and S. I. Lee, "Using wearable and deep learning techniques to assess performed movement in stroke survivors: Kinematic analysis of point-to-point movements during functional activities," *IEEE J. Biomed. Health Inform*, Dec. 2022, [Under Review].

[J4] **B. Oubre** and S. I. Lee, "Towards estimating upper-limb impairment in stroke survivors using a single wrist-worn sensor," *J. Neuroeng. Rehabil.*, Aug. 2022, [Under Review].

[J5] 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.

[J6] **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]**.

[J7] **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.

[J8] **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.

[J9] **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]**.

[J10] 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**, 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].

[A2] **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.

[A3] **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].

[A4] 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.

Teaching

COMPSCI 590W / INFO 390W: Health Informatics and Data Science

UMass Amherst

Teaching Assistant

Spring 2022

- Small (about 35 students), joint masters-level and undergraduate course tailored for students with both clinical and computational backgrounds.
- Developed and refined course content, held office hours, and taught weekly discussion sections.
- Nominated for outstanding teaching assistant in Spring 2022.

COMPSCI 240: Reasoning Under Uncertainty

UMass Amherst

Lead Teaching Assistant

Fall 2021

Teaching Assistant

Fall 2020

- Large (about 300 students), lower-division undergraduate course covering the fundamentals of counting, probability, and probabilistic reasoning.
- Held office hours, taught weekly discussion sections, and answered student questions.
- As lead TA, managed many aspects of course administration and ensured consistent student experience across discussion sections.
- Nominated for outstanding teaching assistant in Fall 2021.

COMPSCI 590W: Health Informatics and Data Science

UMass Amherst

Teaching Assistant

Spring 2021

- Small (about 20 students), masters-level course tailored for students with both clinical and computational backgrounds.
- First offering of course; worked with faculty from both the computer science department and medical school to develop course content.

Outreach and Volunteer Activity

Women in Engineering Day and Girls Inc. Workshops

Amherst, Massachusetts

Co-Organizer, Volunteer

Oct. 2017 – July 2022

- Organized (July 2019–Present) and participated in biannual educational outreach workshops for high school girls.
- Lead a workshop (Oct. 2019) and presented an introductory lecture on programming (Oct. 2019, July 2022).
- Guided students in an educational programming activity, where they programmed LED light strips using Arduino and ArduBlock.
- Trained other volunteers and ensured that the workshops ran smoothly.

FIRST FRC Team 4209

Baton Rouge, Louisiana

Mentor

Jan. 2012 – May 2015

FIRST FTC Tournament

Baton Rouge, Louisiana

Volunteer Judge

Dec. 2014