Claire Mitchell

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NSF GRFP fellow in HCI specializing in wearable signals for interaction and accessibility. Extensive knowledge on the use and collection of EMG and wearable biosignals in machine learning models, statistical analysis, and interaction techniques that support diverse users. Experience in advancing accessible computing through methodological contributions, empirical measurement of motor ability, and biosignal-driven interaction. Proven collaborator across engineering, design, and clinical teams to deliver technologies.

Skills

Programming Languages: Python (SciPy, Sklearn, TensorFlow, PyTorch, Matplotlib, Jupyter), MATLAB, R, C#

Methods: Biosignal processing and analysis (EMG, physiological time-series), feature extraction and dimensionality reduction, machine learning model development and evaluation

Research Experience

Graduate Research Assistant, *University of Washington - Information School* Expected 2027

- Analyzed EMG and wearable biosignals using statistical and machine learning approaches to assess feature robustness, parameter effects, and gesture classification accuracy
- Developed and evaluated EMG- and inertial-based interaction techniques to enable accessible technologies.
- Advanced ability-based design through the development of ability heuristics, conceptualization of motor ability, and integration of physiological signals into HCI practices.

Research Scientist Intern, *Meta - Input Explorations Team* Summer 2023

- Trained and analyzed electromyography-based handwriting models to evaluate candidate text editing interactions.
- Developed software for flexible mapping of hand gestures to text editing actions.

Research Engineer, *Delsys, Inc.* 2018 - 2022

- Developed EMG- and IMU–based models to personalize augmentative and alternative communication keyboards.
- Trained deep neural networks using EMG features to model speech pitch and intensity.
- Collected and analyzed EMG, motor unit, and kinematic data for signal characterization and modeling.
- Developed and maintained production software in collaboration with the software engineering team.

Research Assistant, *University of Washington - College of Engineering* 2016 - 2018

- Applied matrix decomposition to EMG signals for muscle synergy analysis and created a web platform enabling real-time calculation, visualization, and exploration.

Education

PhD Information Science, *University of Washington* Expected 2027
Highlighted Coursework: Machine Learning, Machine Learning for Neuroscience, Quantitative Methods

BS Bioengineering, Minor Applied Mathematics, *University of Washington* 2018

Selected Publications & Presentations

Mitchell, C.L., Malcolm, K., Peterson, L.N., Park, C., Yamagami, M. Designing for Diversity: System and Human Factors on EMG Features and Gesture Recognition. In preparation.

Mitchell, C.L., Kong, J., Martinez, J.J., Kane, S.K., Ko, A.J., Hiniker, A., Wobbrock, J.O. Ability Heuristics for Conducting Accessibility Inspections. *Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems (CHI '26).* In press.

Yamagami, M., **Mitchell, C.L.**, Portnova-Fahreeva, A.A., Kong, J., Mankoff, J., Wobbrock, J.O. Customized Mid-Air Gestures for Accessibility: A $B Recognizer for Multi-Dimensional Biosignal Gestures. https://arxiv.org/abs/2409.08402

Mitchell, C.L. and Wobbrock, J.O. (2024). Characterizing "Motor Ability" for Ability-Based Design. *Proceedings of the ACM Conference on Computers and Accessibility (ASSETS '24).* St. John's, Canada (October 28-30, 2024). Article 49.

Mitchell, C.L. and Wobbrock, J.O. (2024). Physiological Signals for Ability-Based Design. Workshop on "Towards Best Practices for Integrating Physiological Signals in HCI (PhysioCHI '24)." ACM Conference on Human Factors in Computing Systems (CHI '24). Honolulu, Hawaii (May 11-16, 2024). Article 18.

Vojtech, J.M., **Mitchell, C.L.**, Raiff L., Kline, J.C., De Luca, G., (2022). Prediction of Voice Fundamental Frequency and Intensity from Surface Electromyographic Signals of the Face and Neck. *Vibration,* 5(4), 692–710.

Mitchell, C.L., Cler, G.J., Fager, S.K., Contessa, P., Roy, S.H., De Luca, G., Kline, J.C., Vojtech, J.M. (2022). Ability-Based Methods for Personalized Keyboard Generation. *Multimodal Technologies and Interaction,* 6(8):67.