

Phillip Walker

pmwalk@gmail.com • www.pmwalk.com

EDUCATION

- Doctor of Philosophy, Intelligent Systems** March 2017
University of Pittsburgh
Dissertation: “Improving Operator Recognition and Prediction of Emergent Swarm Behaviors”
- Master of Science, Intelligent Systems** December 2012
University of Pittsburgh
- Bachelor of Arts, cum laude, Cognitive Science and Economics** May 2010
The College of William and Mary

RESEARCH

- Usability Lab** August 2010 – April 2017
The University of Pittsburgh School of Information Sciences
- Investigated human control of robotic swarms, biologically-inspired rules for emergent swarm behaviors, and visualizations of swarms for operators
 - Designed and conducted multiple user studies, and submitted and edited papers and grant proposals
 - Implemented and currently maintain an agent-based swarm simulator in CUDA and OpenGL
- Cognitive Psychophysiology Lab** May 2009 – May 2010
Sensation and Perception Lab May 2008 – May 2009
The College of William and Mary Psychology Department
- Created a cognitive science major and conducted user studies as part of the Sensation and Perception Lab
 - Assisted in data analysis and submissions to scientific journals for the Cognitive Psychophysiology Lab.

AWARDS AND ACHIEVEMENTS

- University of Pittsburgh Mellon Doctoral Fellowship August 2013 – August 2014
Human Factors and Ergonomics Society Annual Conference CSTG Best Paper Award September 2013
“Levels of Automation for Human Influence of Robotic Swarms”

EMPLOYMENT

- Researcher** May 2017 – Present
Smart Information Flow Technologies (SIFT, LLC)
- Java Developer Intern** May 2010 – August 2010
Perceptronics Solutions
- Writing Consultant** March 2008 – May 2010
College of William and Mary Writing Resources Center

SKILLS AND EXPERIENCE

- Programming: significant experience with C, C++, parallel programming in CUDA, Java, Perl, Python, R languages and Git version control; prior experience with MATLAB and MIT Proto
- Design and Typesetting: experience with Unreal Development Kit (UDK), Tableau, HTML, CSS, and TeX
- Research: eight years of experience conducting user studies; significant experience in statistical analysis and research design
- Embedded Systems: assembly and prototyping experience with microcontrollers including mbed and Arduino

PUBLICATIONS

- Walker, P. (2017, March). Improving operator recognition and prediction of emergent swarm behaviors. Doctoral Dissertation. University of Pittsburgh.
- Nam, C., Walker, P., Sycara, K., Lewis, M. (in press). Predicting trust in human control of swarms via inverse reinforcement learning. In Robot and Human Interactive Communication (RO-MAN), 2017 IEEE International Conference on. IEEE.
- Lewis, M., Sycara, K., Walker, P. (in press). The role of trust in human-robot interaction. In H. Abbass, J. Scholz, D. Reid (Eds.), Foundations of Trusted Autonomy. Springer.
- Walker, P., Lewis, M., Sycara, K. (2016, October). The effect of display type on operator prediction of future swarm states. In Systems, Man, and Cybernetics (SMC), 2016 IEEE International Conference on. (pp. 2521-2526). IEEE.
- Walker, P., Lewis, M., Sycara, K. (2016, October). Characterizing human perception of emergent swarm behaviors. In Systems, Man, and Cybernetics (SMC), 2016 IEEE International Conference on. (pp. 2436-2441). IEEE.
- Kolling, A., Walker, P., Chakraborty, N., Sycara, K., Lewis, M. (2015, October). Human interaction with robot swarms: a survey. In Human-Machine Systems (HMS), 2015 IEEE Transactions on. (pp. 9-26). IEEE.
- Walker, P., Amirpour Amraii, S., Lewis, M., Chakraborty, N., & Sycara, K. (2014, October). Control of swarms with multiple leader agents. In Systems, Man, and Cybernetics (SMC), 2014 IEEE International Conference on (pp. 3567-3572). IEEE.
- Walker, P., Amirpour Amraii, S., Chakraborty, N., Lewis, M., & Sycara, K. (2014, September). Human control of robot swarms with dynamic leaders. In Intelligent Robots and Systems (IROS), 2014 IEEE/RSJ International Conference on (pp. 1108-1113). IEEE.
- Amraii, S. A., Walker, P., Lewis, M., Chakraborty, N., & Sycara, K. (2014, May). Explicit vs. tacit leadership in influencing the behavior of swarms. In Robotics and Automation (ICRA), 2014 IEEE International Conference on (pp. 2209-2214). IEEE.
- Walker, P., Amraii, S. A., Lewis, M., Chakraborty, N., & Sycara, K. (2013, October). Human control of leader-based swarms. In Systems, Man, and Cybernetics (SMC), 2013 IEEE International Conference on (pp. 2712-2717). IEEE.
- Nunnally, S., Walker, P. M., Chakraborty, N., Lewis, M., & Sycara, K. P. (2013, October). Using coverage for measuring the effect of haptic feedback in human robotic swarm interaction. In Systems, Man, and Cybernetics (SMC), 2013 IEEE International Conference on (pp. 516-521). IEEE.
- Walker, P., Nunnally, S., Lewis, M., Chakraborty, N., & Sycara, K. (2013, September). Levels of automation for human influence of robot swarms. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 57, No. 1, pp. 429-433). SAGE Publications. **Won the Computer Systems Technical Group (CSTG) Best Paper Award**
- Nunnally, S., Walker, P., Lewis, M., Chakraborty, N., & Sycara, K. (2013, September). Using haptic feedback in human robotic swarms interaction. In Proceedings of the Human Factors and Ergonomics Society Annual Meeting (Vol. 57, No. 1, pp. 1047-1051). SAGE Publications.
- Kieffaber, P. D., Kruschke, J. K., Walker, P., Hetrick, W. P. (2013, September). Dissociating stimulus-set and response-set in the context of task-set switching," in Journal of Experimental Psychology: Human Perception and Performance. (Vol. 39, No 3, pp. 700-719).
- Walker, P., Nunnally, S., Lewis, M., Kolling, A., Chakraborty, N., & Sycara, K. (2012). Neglect benevolence in human-swarm interaction with communication latency. In Swarm, Evolutionary, and Memetic Computing (pp. 662-669). Springer Berlin Heidelberg.

- Nunnally, S., Walker, P., Lewis, M., Kolling, A., Chakraborty, N., & Sycara, K. (2012). Connectivity differences between human operators of swarms and bandwidth limitations. In *Swarm, Evolutionary, and Memetic Computing* (pp. 713-720). Springer Berlin Heidelberg.
- Walker, P. M., Nunnally, S., Lewis, M., Kolling, A., Chakraborty, N., & Sycara, K. (2012). Investigating neglect benevolence and communication latency during human-swarm interaction. In *AAAI Fall Symposium on Human Control of Bio-Inspired Swarms*. American Association for Artificial Intelligence.
- Nunnally, S., Walker, P. M., Lewis, M., Kolling, A., Chakraborty, N., & Sycara, K. (2012, November). Robotic swarm connectivity with human operation and bandwidth limitations. In *AAAI Fall Symposium on Human Control of Bio-Inspired Swarms*. American Association for Artificial Intelligence.
- Walker, P., Nunnally, S., Lewis, M., Kolling, A., Chakraborty, N., & Sycara, K. (2012, October). Neglect benevolence in human control of swarms in the presence of latency. In *Systems, Man, and Cybernetics (SMC), 2012 IEEE International Conference on* (pp. 3009-3014). IEEE.
- Nunnally, S., Nunnally, S., Walker, P., Kolling, A., Chakraborty, N., Lewis, M., Sycara, K., & Goodrich, M. (2012, October). Human influence of robotic swarms with bandwidth and localization issues. In *Systems, Man, and Cybernetics (SMC), 2012 IEEE International Conference on* (pp. 333-338). IEEE.
- Walker, P. M., Kolling, A., & Lewis, M. (2011, October). Human exploration patterns in unknown, time-sensitive environments. In *Systems, Man, and Cybernetics (SMC), 2011 IEEE International Conference on* (pp. 2870-2876). IEEE.
- Siegel, E. H., Walker, P., Stefanucci, J. K. (2009). "So close and yet so far away: An effect of disgust on distance perception and graspability," Poster presented at the 9th Annual Meeting of the Society for Vision Sciences, Naples, FL. findings.