

NATHAN L. TENHUNDFELD, Ph.D.

Assistant Professor
University of Alabama in Huntsville
NLT0006@uah.edu

Professional Experience

Assistant Professor (2019 – Present)

Department of Psychology
University of Alabama in Huntsville
Huntsville, AL

Human-Machine Teaming Lead – Postdoctoral Position (2017 – 2019)

Warfighter Effectiveness Research Center
United States Air Force Academy
Colorado Springs, CO

Associate Investigator - Contactor (2016 - 2017)

Warfighter Effectiveness Research Center
United States Air Force Academy
Colorado Springs, CO

Education

Colorado State University, Ph.D. (2017)

Fort Collins, CO
Cognitive Psychology
Advisor: Jessica Witt
Dissertation Committee: Ben Clegg, Alyssa Gibbons, C.A.P. Smith, & Chris Wickens

Colorado State University, M.S. (2015)

Fort Collins, CO
Cognitive Psychology
Advisor: Jessica Witt

University of Virginia, B.A. (2012)

Charlottesville, VA
Major: Psychology

Research Grants

Formation, Implementation, and Verification of Requirements for Human-Autonomy Teaming. (Weger, PI; Mesmer, Co-PI; **Tenhundfeld**, Co-I; Jones, Co-I). Funding by *Naval Postgraduate School – CRUSER* (October 2020 – October 2021). Total amount awarded: \$150,000.

Performance Enhancement Through HCI. (Gholston, PI; Mesmer, Co-PI; **Tenhundfeld**, Lead Researcher; Weger, Lead Researcher). Funding by *U.S. Army*. (May 2020 – August 2022). Total amount awarded: \$150,000.

Robot Design Impacts on High Risk Environment Use. (**Tenhundfeld** is sole PI). Funding awarded by the University of Alabama in Huntsville’s New Faculty Research Program (NFR) (January 2020 – January 2021). Total amount awarded: \$10,000.

Motivating Use of Unmanned Assets in Human-Autonomy Teaming. (Mesmer, PI; Weger, Co-PI; **Tenhundfeld**, Lead Researcher). Funding by *Naval Postgraduate School – CRUSER* (September 2020 – September 2021). Total amount awarded: \$90,000.

Pilot Vehicle Interface and Decision Support Application for Optimum Engagement of Manned/Unmanned Systems in a Dynamic, High Threat Environment. (**Tenhundfeld**, PI; Tossell, Co-PI). Funding by *Lockheed Martin* (July 2018 – July 2019). Total amount awarded: \$39,500

Awards

Raja Parasuraman Award for Scientific Impact – 2nd International Neuroergonomics Society Conference (2018)

Student Travel Award – American Psychological Association’s Division 19 (2015)

Invited Talks

Tenhundfeld, N.L. (2020). *The Long Road to Autonomous Cars: Human-Machine Teaming in a Tesla Model X.* Center for Human, AI and Robot Teaming, Arizona State University, Tempe, AZ.

Tenhundfeld, N.L., de Visser, E.J., Finomore, V.S., & Tossell, C.C. (2019). *Autonomy in Operational Environments.* Talk presented at the Applied Human Factors and Ergonomics Workshop in Human-Machine Teaming, Washington, DC.

Tenhundfeld, N.L. (2019). *Human and Machine: Human Factors in HMT at the US Air Force Academy*. Talk presented at annual Lockheed Martin Autonomy Executive Steering Committee Meeting, Denver, CO.

Tenhundfeld, N.L. & Tossell, C.C. (2018). *Trusting, using, and understanding robotic and AI systems in war*. Talk presented at the Robotics Science and Systems Workshop in Adversarial Robotics, Carnegie Mellon University, Pittsburgh, PA.

Tenhundfeld, N.L. (2016). *Perception is action-specific*. Center for Research on Training, University of Colorado, Boulder, CO.

Journal Publications (* denotes undergraduate)

Tenhundfeld, N.L., Demir, M., & de Visser, E.J., (2020). *An Argument for Trust Assessment in Human-Machine Interaction: Overview and Call for Integration*. Manuscript submitted.

de Visser, E.J., **Tenhundfeld, N.L.**, Donadio, B.T., Ries, A.J., Kim, B., Phillips, E., Tossell, C.C. (2020). *Paving the Way Towards Autonomous Parking Valets: On the Costs and Benefits of Trusting Automated Parking Assist Systems*. Manuscript submitted.

Witt, J.K., Parnes, J.E., & **Tenhundfeld, N.L.**, (2020). Wielding a gun increases judgments of others as holding guns: a randomized controlled trial. *Cognitive Research: Principles and Implications*, 5(1), 1 – 17.

Tenhundfeld, N.L. & Witt, J.K. (2020). Human and Machine: Evaluating whether action automation influences visual perception. *Attention, Perception, & Psychophysics*, 82(6), 3234-3249.

Tenhundfeld, N.L., de Visser, E.J., Ries, A.J., Finomore, V.S., & Tossell, C.C. (2020). Trust and distrust of automated parking in a Tesla Model X. *Human Factors*, 62(2), 194 – 210.

Tenhundfeld, N.L., Parnes, J., Conner, B.T., & Witt, J.K. (2020). Development of a psychometrically valid gun attitude scale. *Current Psychology*, 39(1), 279 - 286.

Tenhundfeld, N.L., de Visser, E.J., Haring, K.S., Ries, A.J., Finomore, V.S., & Tossell, C.C. (2019). Calibrating trust in automation through familiarity with the autoparking feature of a Tesla Model X. *Journal of Cognitive Engineering and Decision Making*, 13(4), 279 – 294.

Laitin, E., Tymoski, M.J., **Tenhundfeld, N.L.**, & Witt, J.K. (2019). The Uphill Battle for Action-Specific Perception. *Attention, Perception, & Psychophysics*, 81(3), 778 - 793

Witt, J.K., **Tenhundfeld, N.L.**, & Tymoski, M.R. (2018). Is there a chastity belt on perception? *Psychological Science*, 29(1), 139-146.

Tenhundfeld, N.L., & Witt, J.K. (2017). Distances on hills look farther than distances on flat ground: Evidence from converging measures. *Attention, Perception, & Psychophysics*, 79(4), 1165-1181.

King, Z.R., **Tenhundfeld, N.L.**, & Witt, J.K. (2017). What you see and what you are told: Evidence for a genuinely perceptual action-specific effect. *Psychological Research*, 1-13.

Witt, J.K., **Tenhundfeld, N.L.**, & Bielak, A.M. (2016). Dissociating perception from judgment in the action-specific effect of blocking ease on perceived speed. *Attention, Perception, & Psychophysics*, 79(1), 283-297.

Witt, J.K., Sugovic, M., **Tenhundfeld, N.L.**, & King, Z.R. (2016). An action-specific effect on perception that survives all pitfalls. *Behavioral and Brain Sciences*, 39.

Tenhundfeld, N. L. & Witt, J.K. (2015). The effects of interoceptive attunement on action-specific perception. *Visual Cognition*, 23(7), 837-840.

Peer-Reviewed Conference Proceedings (* denotes undergraduate)

Matsuyama, L., *Zimmerman, R., Eaton, C., Weger, K., Mesmer, B., **Tenhundfeld, N.L.**, Van Bossuyt, D., & Semmens, R. (2021). Determinants that are believed to influence the acceptance and adoption of mission critical autonomous systems. In *Proceedings of the AIAA SciTech Forum*.

Gillmore, S. & **Tenhundfeld, N.L.** (2021). The Good, The Bad, and The Ugly: Evaluating Tesla's Human Factors in the Wild West of Self-Driving Cars. In *Proceedings of the Human Factors and Ergonomics Society Conference*.

Tenhundfeld, N.L., Phillips, E.K., & Davis, J.R. (2021). Robot Career Fair: An Exploratory Evaluation of Anthropomorphic Robots in Various Career Categories. In *Proceedings of the Human Factors and Ergonomics Society Conference*.

*Simon, H.M., *Smitherman, H.M., *Atchley, A., Davis, J.R., & **Tenhundfeld, N.L.** (2020). Nuts and Bolts About You: Finding the Right Match for Gendered Robots. In *Proceedings of the annual Systems and Information Engineering Design Symposium (SIEDS) Conference*.

- Davis, J.R., *Atchley, A., *Smitherman, H.M., *Simon, H.M., & **Tenhundfeld, N.L.** (2020). Measuring Automation Bias and Complacency in an X-Ray Screening Task. In *Proceedings of the annual Systems and Information Engineering Design Symposium (SIEDS) Conference*.
- Haring, K.S., Tobias, J., Waligora, J., Phillips, E., **Tenhundfeld, N.L.**, Lucas, G., de Visser, E.J., Gratch, J., & Tossell, C.C. (2019). Conflict mediation in human-machine teaming: Using a virtual agent to support mission planning and debriefing. In *Proceedings of the 28th IEEE International Conference on Robot and Human Interactive Communication (Ro-Man 2019)*.
- Tossell, C.C., Donadio, B.T., Stewart, A., **Tenhundfeld, N.L.**, Phillips, E., Driggs, J., Haring, K.S., & de Visser, E.J. (2019). Research with Undergraduate Students: Recommendations from Capstone Research at the United States Air Force Academy. In *Proceedings of the Human Factors and Ergonomics Society Conference*.
- *Alexander, S., *Rozo, J., Donadio, B.T., **Tenhundfeld, N.L.**, de Visser, E.J., & Tossell, C.C. (2019). Transforming the Air Force mission planning process with virtual and augmented reality. In *Proceedings of the annual Systems and Information Engineering Design Symposium (SIEDS) Conference*.
- *Lorenz, G.T., *Ehrenstrom, J.S., *Ullman, T.B., *Palmer, R.C., **Tenhundfeld, N.L.**, de Visser, E.J., Donadio, B.T., & Tossell, C.C. (2019). Assessing control devices for the supervisory control of autonomous wingmen. In *Proceedings of the annual Systems and Information Engineering Design Symposium (SIEDS) Conference*.
- *Tomczak, K., *Pelter, A., *Gutierrez, C., *Stretch, T., *Hilf, D., Donadio, B.T., **Tenhundfeld, N.L.**, de Visser, E.J., & Tossell, C.C. (2019). Let Tesla park your Tesla: Driver trust in a semi-automated car. In *Proceedings of the annual Systems and Information Engineering Design Symposium (SIEDS) Conference*.
- Tenhundfeld, N.L.**, de Visser, E.J., Tossell, C.C., & Finomore, V.S. (2018). Evaluating and Modeling Human-Machine Teaming and Trust in Automation while on the Road. In *Proceedings of the 2nd International Neuroergonomics Conference*.
- Haring, K. S., Finomore, V., *Muramoto, D., **Tenhundfeld, N. L.**, Redd, M., Wen, J., & Tidball, B. (2018). Analysis of Using Virtual Reality (VR) for Command and Control Applications of Multi-Robot Systems. In *Proceedings of the 1st International Workshop on Virtual, Augmented, and Mixed Reality for HRI (VAM-HRI)*.

Book Chapters (* denotes undergraduate)

- Tenhundfeld, N.L.**, Rowe, J., & Franco-Zamudio, J. L. (2014). Achievement. In *Encyclopedia of Critical Psychology*. (pp. 18-20). Springer New York.
- *Gonzalez, V., **Tenhundfeld, N.L.**, *Dominguez, C., & Franco-Zamudio, J. L. (2014). Collaboration. In *Encyclopedia of Critical Psychology* (pp. 254-256). Springer New York.
- *Shevlin, A., **Tenhundfeld, N.L.**, *Gonzalez, V., & Franco-Zamudio, J. L. (2014). Domestic Violence, Overview. In *Encyclopedia of Critical Psychology* (pp. 484-487). Springer New York.
- *Zeringue, M., *Cline, K., **Tenhundfeld, N.L.**, & Franco-Zamudio, J. L. (2014). Coping, Overview. In *Encyclopedia of Critical Psychology* (pp. 322-324). Springer New York.
- *Peltier, C., *Wilson, C., *Williford, W., **Tenhundfeld, N.L.**, & Franco-Zamudio, J. L. (2014). Volunteerism. In *Encyclopedia of Critical Psychology* (pp. 2068-2072). Springer New York.

Other Invited Scholarly Activities

- Tenhundfeld, N.L.** & Demir, M. (2020). *Do you trust your parachute? A call to study human-machine teaming in uncontrolled environments*. Invited submission for the U.S. Navy Aerospace Experimental Psychology Society's Call Signs.

Media Appearances

Here's Where AI Has Taken Over the Clinic – Automation is now used in everyday healthcare tasks, but it's not as Sci-Fi as one might image (December 15, 2020). *MedPage Today*.

[Link](#)

Trust in Automation (March 22, 2020). *The Measure of Everyday Life* on WNCU.

[Link](#)

How Your Body Changes Your Visual Perception as You Walk (June 15, 2017). *Psychology Today*.

[Link](#)

Conference Presentations (* denotes undergraduate)

Matsuyama, L., Weger, K., Mesmer, B., **Tenhundfeld, N.**, Van Bossuyt, D., & Semmens, R. (2020). *Autonomous Systems Adoption Challenges and Requirements Management Solutions*. Presentation given at JIFX 20-4 Technology Expo, Online.

Davis, J.R., *Smitherman, H., & **Tenhundfeld, N.L.** (2020). *Effects of Robotic Anthropomorphic Design on Industry Category Fit*. Poster presented at *UX Rising*, Huntsville, AL.

Katrein, S. P., Driggs, J.B., Phillips, E.K., Ries, A.J., Haring, K.S., Seech, T.R., **Tenhundfeld, N.L.**, de Visser, E.J., & Tossell, C.C. (2019). *Human factors research in USAFA's Warfighter Effectiveness Research Center*. Poster presented at the annual meeting of the *Human Factors Engineering Technical Advisory Group (HFE TAG)*, Aberdeen Proving Ground, MD.

*Lorenz, G.T., *Ehrenstrom, J.S., *Ullman, T.B., **Tenhundfeld, N.L.**, Neigel, A.R., de Visser, E.J., Donadio, B.T., & Tossell, C.C. (2019). *Autonomous Wingman: Examining Workload Differences Between Control Devices in the Supervisory Control of Unmanned Aerial Systems*. Poster presented at the annual meeting of *The Rocky Mountain Psychological Association*, Denver, CO.

*Titus, C., *Hammond, P., **Tenhundfeld, N.L.**, Tossell, C.C. (2019). *Optimizing airman running performance and cognition using real-time feedback from wearable sensors*. Poster presented at the annual meeting of the *Rocky Mountain Psychological Association*, Denver, CO.

*Lorenz, G.T., *Ehrenstrom, J.S., *Ullman, T.B., **Tenhundfeld, N.L.**, Neigel, A.R., de Visser, E.J., Donadio, B.T., & Tossell, C.C. (2019). *Autonomous Wingman: Examining Workload Differences Between Control Devices in the Supervisory Control of Unmanned Aerial Systems*. Poster presented at the annual meeting of *Human Factors and Applied Psychology*, Orlando, FL.

Tenhundfeld, N.L., Haring, K.S., Wen, J., Finomore, V., & Tossell, C. C. (2018). *Integration of Muse Headband EEG System to Detect Workload and G-Force Induced Loss of Consciousness (GLOC)*. Poster presented at the annual meeting of *Applied Human Factors and Ergonomics*, Orlando, FL.

*Moorehead, N.R., *Getlinger, M., Strang, A., **Tenhundfeld, N.L.**, Finomore, V.S., & Tossell, C.C. (2018). *Augmenting Airmen Endurance Performance Using Real-Time Physio-behavioral Feedback*. Poster Presented at the annual meeting of *Human Factors Engineering Technical Advisory Group (HFE TAG)*, Hurlburt Field, FL.

- Laitin, E.L., Tymoski, M.J., **Tenhundfeld, N.L.**, & Witt, J.K. (2018). *Distances Appear Farther on Hills: Evidence for Top-Down Effects*. Poster presented at the annual meeting of the *Vision Science Society*, St. Pete Beach, FL.
- *Fitzgerald, N.J., **Tenhundfeld, N.L.**, & Witt, J.K. (2018). *Failure is Not an Option: Testing the Effects of Automation Failure on the Perceptual System*. Poster presented at the annual meeting of the *Vision Science Society*, St. Pete Beach, FL.
- Elliot, A., Finomore, V.S., Tripp, L., **Tenhundfeld, N.L.**, & Tossell, C.C. (2018). *Comparison of the Heart Rate Capabilities of the Jabra Sport Plus Special Edition Headphones with Valencell Heart Rate Headphones*. Poster presented at the annual meeting of the *Rocky Mountain Psychological Association*, Denver, CO.
- *Moorehead, N.R., Strang, A., **Tenhundfeld, N.L.**, Finomore, V.S., & Tossell, C.C. (2018). *Augmenting Human Endurance Performance Using Real-Time Feedback*. Poster presented at the annual meeting of the *Rocky Mountain Psychological Association*, Denver, CO.
- Tenhundfeld, N.L.**, *Crandell, A., McClernon, C., & Finomore, V. (2017). *Motion seat use in flight simulators for new pilots*. Poster presented at the annual meeting of the *International Symposium on Aviation Psychology*, Dayton, OH.
- Tenhundfeld, N.L.** & Witt, J.K. (2017). *An uphill battle: Distances are reported as farther on a hill even when immediate feedback about estimation accuracy is provided*. Poster presented at the annual meeting of the *Vision Science Society*, St. Pete Beach, FL.
- Witt, J.K., **Tenhundfeld, N.L.**, Janzen, M.R., Tymoski, M.T., & Wilmer, J. (2017). *Action-specific effects in perception and their mechanisms*. Poster presented at the annual meeting of the *Vision Science Society*, St. Pete Beach, FL.
- Tymoski, M.T., **Tenhundfeld, N.L.**, Janzen, M.R., & Witt, J.K. (2017). *I cannot afford both: Walk-through-ability affordance judgments do not correlate to the distance-on-hill effect*. Poster presented at the annual meeting of the *Vision Science Society*, St. Pete Beach, FL.
- Janzen, M.R., **Tenhundfeld, N.L.**, Tymoski, M.T., & Witt, J.K. (2017). *Distance on hill overestimation is not influenced by hiking experience*. Poster presented at the annual meeting of the *Vision Science Society*, St. Pete Beach, FL.
- Tenhundfeld, N.L.** & Witt, J.K. (2016). *Three's company: Energetics' effect on perception as shown with blindwalking, Visual Matching, and Verbal Estimates*. Poster presented at the annual meeting of the *Vision Sciences Society*, St. Pete Beach, FL.

Janzen, M., **Tenhundfeld, N.L.**, & Witt, J.K. (2016). *That's so far! Experienced hikers also overestimate distances on a hill*. Poster presented at the annual meeting of the *Vision Sciences Society*, St. Pete Beach, FL.

Witt, J.K., King, Z.R., & **Tenhundfeld, N.L.** (2015). *Losing control in action-specific effects: Evidence for Bayesian integration*. Talk presented at Psychonomic Society Annual Meeting, Chicago, IL.

Tenhundfeld, N.L., & Witt, J.K. (2015) The effects of interoceptive attunement on action-specific perception. Talk presented at Object Perception, Attention, and Memory Conference, Chicago, IL.

King, Z.R., **Tenhundfeld, N.L.**, & Witt, J.K. (2015). *An action-specific perception effect that withstands feedback*. Poster presented at the Object Perception, Attention and Memory Conference, Chicago, IL.

Tenhundfeld, N.L. & Witt, J.K. (2015). *Perceptual distortions of distances on a hill depend on interoceptive awareness*. Poster presented at the annual meeting of the *Vision Sciences Society*, St. Pete Beach, FL.

King, Z.R., **Tenhundfeld, N.L.**, & Witt, J.K. (2015). *An action-specific perception effect that withstands feedback*. Poster presented at the annual meeting of the *Vision Sciences Society*, St. Pete Beach, FL.

Witt, J.K., Conner, B.T., **Tenhundfeld, N.L.**, & Parnes, J.E. (2015). *Gun-embodiment biases on object perception are affected by prior experience*. Poster presented at the annual meeting of the *Vision Sciences Society*, St. Pete Beach, FL.

Tenhundfeld, N. L. & Witt, J. K., (2014). *Informed perception: Catching ability changes perceived size of ball*. Poster presented at the annual meeting of the *Vision Sciences Society*, St. Pete Beach, FL.

Tenhundfeld, N.L., *LaChute, C., *Martin, E., *Iglesias, D. J., *Cline, K., *Shevlin, A., *Babbington, A., *Himmel, A., & Franco-Zamudio, J. L. (2013). *Identifying sources of academic self-efficacy among underrepresented undergraduates in the sciences*. Poster presented at the *Georgia Undergraduate Research in Psychology Conference*, Kennesaw, GA.

Sole Instructor Teaching Experience

Human Factors

University of Alabama in Huntsville

Course Evaluation – Fall 2020: 4.72 (out of 5.00)

Course Evaluation – Fall 2019: 4.74 (out of 5.00)

Introduction to Psychology

University of Alabama in Huntsville

Course Evaluation – Spring 2020: 4.71 (out of 5.00)

Perception

University of Alabama in Huntsville

Course Evaluation – Spring 2020: 4.85 (out of 5.00)

Applications of Psychology

University of Alabama in Huntsville

Course Evaluation – Summer 2020: 4.54 (out of 5.00)

Course Evaluation – Summer 2020: 4.77 (out of 5.00)

Course Evaluation – Spring 2020: 4.67 (out of 5.00)

Statistics

University of Alabama in Huntsville

Course Evaluations – Fall 2020: 4.77 (out of 5.00)

Course Evaluations – Fall 2019: 4.59 (out of 5.00)

Human Research I

University of Alabama in Huntsville

Course Evaluation – Fall 2019: 5.00 (out of 5.00)

Introduction to Behavioral Science

US Air Force Academy

Course evaluations unavailable

Systems Engineering Capstone

US Air Force Academy

Course evaluations unavailable

Behavioral Science Capstone

US Air Force Academy

Course evaluations unavailable

Sensation & Perception

Colorado State University

Course evaluations unavailable

Cognitive Psychology Lab

Colorado State University

Course evaluations unavailable

Sensation & Perception Lab

Colorado State University

Course evaluations unavailable

Ad Hoc Manuscript Reviewing Activity

Human Factors

Human-Robot Interaction

Journal of Experimental Psychology: Applied

Psychonomic Bulletin & Review

Social Science Journal

Ergonomics

Human Factors and Ergonomics in Manufacturing & Service Industries

Volunteer Positions / Service

Human Factors and Ergonomics Society (HFES) – Tennessee Valley Chapter

President (2021 – Present)

Vice President (2019 – 2021)

PSI CHI Faculty Advisor (2019 – Present)

APA Division 19 (Society for Military Psychology)

Student Affairs Committee (2016 – 2019)

Chair-Select (2016 – 2017)

Chair (2017 – 2018)

Past-Chair (2018 – 2019)

Regional Student Representative for the Western U.S. (2014 – 2015)

Students Advised

Hannah Smitherman (*current*)

Jenna Cotter (*current*)

Andrew Atchley (*current*)

Emily O’Hear (*current*)

Jake Davis (M.A., 2020)

Current Position: User Experience Researcher at Tektonux

PhD Committees

2018

Jaymen Elliott (University of Technology Sydney)

Masters Committees

2020

Jonathan Sullivan (University of Alabama in Huntsville)
Christina Cabanas (University of Alabama in Huntsville)

2019

Logan “Forest” Williamson (University of Alabama in Huntsville)

Comprehensive Exam Committees

2020

Raashaun Jones (University of Alabama in Huntsville)
Jake Theut (University of Alabama in Huntsville)