CURRICULUM VITAE

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EDUCATION

Ph.D., Psychology (Perception), June 1990, Northwestern University, Evanston, IL.

M.S., Psychology (Perception), August 1987. Northwestern University, Evanston, IL.

B.Sc., Psychology (First Class Honors), May 1985. University of Alberta, Edmonton, Alberta, Canada.

EMPLOYMENT

Professor, Wright State University, Dept of Psychology, Dayton, OH
Aug, 2013 - present.

Affiliate Scientist, Smith-Kettlewell Eye Research Institute, San Francisco, CA
Aug, 1995 - present.

Associate Professor, Wright State University, Dept of Psychology, Dayton, OH
Sept, 2000 - July, 2013.

Assistant Professor, Wright State University, Dept of Psychology, Dayton, OH
Aug, 1995 - Aug, 2000.

Research Associate, Smith-Kettlewell Eye Research Institute, San Francisco, CA
Jan, 1993-July, 1995.

Post-Doctoral Fellow, Smith-Kettlewell Eye Research Institute, San Francisco, CA
Oct, 1989-Dec. 1992.

Research Assistant for Dr. Robert Sekuler, Northwestern University, Psychology Dept, Evanston, IL 1986-1989.

Research Assistant for Dr. Stanley Rule, University of Alberta, Psychology Dept, Edmonton, Alta., Canada 1984-1985.

HONORS

Reviewer recognition for “outstanding contribution to the quality of the journal”, Attention, Perception, & Psychophysics (Psychonomic Society), January 2023.

Best Track Paper award in the Facilites Design and Planning track at the 2018 IISE Annual

Conference (Orlando, FL), May 21, 2018

Journal of Vision Editor-in-Chief's article of the month, November 2017.

Writing Across the Curriculum Faculty Recognition Award, May 28, 2010

Outstanding Faculty Member 2009, WSU Psi Chi/Psychology Club

Top Reviewer in 2008, Vision Research

Rachel C. Atkinson Postdoctoral Fellowship, Smith-Kettlewell Eye Research Institute, San Francisco, CA October 1989 - December 1990.

Fellowship for McDonnell Summer Institute in Cognitive NeuroScience, Dartmouth College, Hanover, NH June, 1989.

Senior Teaching Fellow, Northwestern University, Evanston, IL 1986-1989.

Northwestern University Scholar, Northwestern University, Evanston, IL 1985-1986.

National Science and Engineering Research Counsel Summer Research Grant, University of Alberta, Edmonton, Alberta, Canada May - August 1984.

TEACHING EXPERIENCE

Wright State University

Graduate Courses:	Visual Science-PSY 776 Visual Science Lab-PSY 777 Cortical Visual Functions and their Applications-PSY 778 Fundamentals of Motion Perception-PSY 886 Perception - PSY 7060
Undergraduate Courses:	Research Design & Methods-PSY 300 Basic Research Methods in Psychology - PSY 301 Perception-PSY 371, PSY 3710 Psychology: The Science of Behavior - PSY 105

Northwestern University

Teaching Assistant:	Perception (Fall 1985,1987,1988) Perception Lab (Winter 1986) Linear Models:Advanced Topics (Spring 1986).

ORGANIZATIONS

Member of: Society for Neuroscience (SfN), Vision Sciences Society (VSS), Human Factors & Ergonomics Society, Southern Ohio chapter (HFES SOH)

PROFESSIONAL SERVICE

Moderator at the Vision Sciences Society (VSS) annual meeting, 2017.

Member, Scientific Review Panel, National Science Foundation, October, 2003.

Moderator at the Society for Neuroscience annual meeting, 2000.

Moderator at the Association for Research in Vision & Ophthalmology (ARVO) annual conference, 1997.

Moderator at the Association for Research in Vision & Ophthalmology (ARVO) annual conference, 1995.

Reviewer of grants for the Air Force Office of Scientific Research, the National Science Foundation, Welcome Trust (Europe) 1992-present.

Reviewer of manuscripts for scientific journals: Neural Networks; Journal of Vision; Visual Neuroscience; Vision Research; Nature; Journal of the Optical Society; Perception; Perception & Psychophysics; Attention, Perception and Psychophysics; Proceedings of the National Academy of Science; Journal of the Society for Information Display; PLoS One; Australian Journal of Psychology; Displays; i-Perception; Scienitifc Reports 1989-present.

PUBLICATIONS

1. Chandna, A., Singh, D., Watamaniuk, S.N.J., & Heinen, S.J. (in preparation). Asymmetric eye movements during fixation challenge Hering's Law of a unitary neural command. Scientific Reports.
2. Heinen, S.J., Singh, D., & Watamaniuk, S.N.J. (submitted 11-28-23, in revision). Pursuit is altered by saccade adaptation. Journal of Neuroscience.
3. Heinen, S.J., Chanda, A., Singh, D., & Watamaniuk, S.N.J. (submitted 9-27-23). A new oculomotor model demystifies "Remarkable Saccades". Vision Research.
4. Watamaniuk, S.N.J., Badler, J.B., & Heinen, S.J. (2023). Peripheral targets attenuate miniature eye movements during fixation. Scientific Reports, 13:7418, 1-9. (doi: 10.1038/s41598-023-34066-2)
5. Chanda, A., Badler, J.B., Singh, D., Watamaniuk, S.N.J., & Heinen, S.J. (2021). A covered eye fails to follow an object moving in depth. Scientific Reports, May 26;11(1):10983. (doi: 10.1038/s41598-021-90371-8).
6. Badler, J.B., Heinen, S.J., & Watamaniuk, S.N.J. (2019). A common mechanism modulates saccade timing during pursuit and fixation. Journal of Neurophysiology, 122, 1981-1988.
7. Heinen, S.J., Badler, J.B., & Watamaniuk, S.N.J. (2018). Choosing a foveal goal recruits the saccadic system during smooth pursuit. Journal of Neurophysiology, 120, 489-496. (doi: 10.1152/jn.00418.2017)
8. Watamaniuk, S.N.J., Bal, J., & Heinen, S.J. (2017). A subconscious interaction between fixation and anticipatory pursuit. Journal of Neuroscience, 37, 11424-11430. (doi: doi.org/10.1523/JNEUROSCI.2186-17.2017)
9. Ma, Z., Watamaniuk, S.N.J., Heinen, S.J. (2017). Illusory motion reveals velocity matching, not foveation, drives smooth pursuit of large objects. Journal of Vision, 17(12):20, 1-14. (doi: 10.1167/17.12.20)
10. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2016). A foveal target increases catch-up saccade frequency during smooth pursuit. Journal of Neurophysiology, 115, 1220-1227 (doi:10.1152/jn.00774.2015).
11. Watamaniuk, S.N.J. & Heinen, S.J. (2015). Allocation of attention during pursuit of large objects is no different than during fixation. Journal of Vision. 15(9):9. (doi:10.1167/15.9.9)

12. Maus, G., Potapchuk, E., Watamaniuk, S., & Heinen, S. (2015). Different time scales of motion integration for anticipatory smooth pursuit and perceptual adaptation. Journal of Vision, 15(2):16. (doi:10.1167/15.2.16)

13. McIntire, J.P., Wright, S.T., Harrington, L.K., Havig, P.R., Watamaniuk, S.N.J., & Heft, E.L. (2015). Binocular fusion ranges and stereoacuity predict positional and rotational spatial task performance on a stereoscopic 3D display. Journal of Display Technology, 99. (doi:10.1109/JDT.2014.2367161)

14. Jin, Z., Watamaniuk, S.N.J., Khan, A.Z., Potapchuk, E., & Heinen, S.J. (2014). Motion integration for ocular pursuit does not hinder perceptual segregation of moving objects. Journal of Neuroscience, 34, 5835-5841. (doi: 10.1523/JNEUROSCI.4867-13.2014)

15. McIntire, J., Wright, S., Harrington, L.K., Havig, P., Watamaniuk, S., & Heft, E. (2014). Optometric measurements predict performance but not comfort on a virtual object placement task with a stereoscopic 3D display. Optical Engineering, 53, 061711. (doi:10.1117/1.OE.53.6.061711)

16. McIntire, J., Havig, P., Harrington, L.K., Wright, S., Watamaniuk, S.N.J., & Heft, E.L. (2014). Clinically normal stereopsis does not ensure a performance benefit from stereoscopic 3D depth cues. 3D Research, 5, 20. (doi: 10.1007/s13319-014-0020-9)

17. Jin, Z., Reeves, A., Watamaniuk, S.N.J., & Heinen, S.J. (2013). Shared attention for smooth pursuit and saccades. Journal of Vision, 13, 4, 7 (doi:10.1167/13.4.7)

18. Watamaniuk, S.N.J., Sekuler, R., & McKee, S.P. (2011). Perceived global flow direction reveals local vector weighting by luminance. Vision Research, 51, 1129-1136.

19. Heinen, S.J., Jin, Z., Reeves, A., & Watamaniuk, S.N.J. (2011). Flexibility of foveal attention during ocular pursuit. Journal of Vision, 11, 2, 9. (doi: 10.1167/11.2.9)

20. McIntire, J.P., Havig, P.R., Watamaniuk, S.N.J., & Gilkey, R.H. (2010). Visual search performance with 3-d auditory cues: Effects of motion, target location, and practice. Human Factors, 52, 41-53. (doi:10.1177/0018720810368806)

21. Watamaniuk, S.N.J. & Heinen, S.J. (2007). Storage of an oculomotor motion aftereffect. Vision Research, 47, 466-473. PMID: 17239421

22. Watamaniuk, S. N. J. (2005). The predictive power of trajectory motion. Vision Research, 45, 2993-3003. PMID: 16153677

23. Watamaniuk, S. N. J., & Heinen, S. J. (2003). Perceptual and oculomotor evidence of limitations on processing accelerating motion. Journal of Vision, 3(11), 698-709. http://journalofvision.org/3/11/5/, doi:10.1167/3.11.5. PMID: 14765954

24. Watamaniuk, S.N.J., Flinn, J., & Stohr, R.E. (2003). Segregation from direction differences in dynamic random-dot stimuli. Vision Research, 43, 171-180. PMID: 12536139

25. Watamaniuk, S.N.J. (2003). Motion perception. In R. B. Johnson and R. G. Driggers (Eds.), The Encyclopedia of Optical Engineering (pp. 1380-1389). New York: Marcel Dekker.

26. Sekuler, R., Watamaniuk, S.N.J. & Blake, R. (2002). Perception of visual motion. In H. Pashler (Series Ed.) & S. Yantis, (Vol. Ed.), Steven's Handbook of Experimental Psychology: Vol 1. Sensation and Perception (3rd ed., pp. 121-176). New York: Wiley.

27. Morgan, M.J., Watamaniuk, S.N.J., & McKee, S.P. (2000). The use of an implicit standard in measuring discrimination thresholds. Vision Research, 40, 2341-2349. PMID: 10927119

28. Watamaniuk, S.N.J. (1999). Invited review of the book, High-level motion processing: Computational, neurobiological, and psychophysical perspectives , Optometry and Vision Science, 76.

29. Watamaniuk, S.N.J. & Heinen, S.J. (1999). Human smooth pursuit direction discrimination. Vision Research, 39, 59-70. PMID: 10211396

30. Verghese, P., Watamaniuk, S.N.J., McKee, S.P., & Grzywacz, N.M. (1999). Local motion detectors cannot account for the detectability of an extended trajectory in noise. Vision Research, 39, 19-30. PMID: 10211392

31. Harris, J.M., McKee, S.P., & Watamaniuk, S.N.J. (1998). Visual search for motion-in-depth: Stereomotion does not 'pop-out' from disparity noise. Nature Neuroscience, 1, 165-168. PMID: 10195134

32. Heinen, S.J. & Watamaniuk, S.N.J. (1998). Spatial integration in human smooth pursuit. Vision Research, 38, 3785-3794. PMID: 9893807

33. Watamaniuk, S.N.J. & McKee, S.P. (1998). Simultaneous encoding of direction at a local and global scale. Perception & Psychophysics, 60, 191-200. PMID: 9529903

34. McKee, S.P., Watamaniuk, S.N.J., Harris, J.M., Smallman, H.S., & Taylor, D.G. (1997). Is stereopsis effective in breaking camouflage for moving targets? Vision Research, 37, 2047-2055. PMID: 9327053

35. Harris, J.M. & Watamaniuk, S.N.J. (1996). Poor speed discrimination suggests that there is no specialized speed mechanism for Cyclopean motion. Vision Research, 36, 2149-2157. PMID: 8776481

36. Watamaniuk, S.N.J. & McKee, S.P. (1995). 'Seeing' motion behind occluders. Nature, 377, 729-730. PMID: 7477261

37. Grzywacz, N.M., Watamaniuk, S. N. J., & McKee, S. P. (1995). Temporal coherence theory for the detection and measurement of visual motion. Vision Research , 35, 3183-3203. PMID: 8533352

38. Bravo, M.J. & Watamaniuk, S.N.J. (1995). Evidence for two speed signals: a coarse local signal for segregation and a precise global signal for discrimination. Vision Research, 35,1691-1697. PMID: 7660577

39. Harris, J.M. & Watamaniuk, S.N.J. (1995). Speed discrimination of motion in depth using binocular cues. Vision Research, 35, 885-896. PMID: 7762146

40. Watamaniuk, S.N.J., McKee, S.P., & Grzywacz, N.M. (1995). Detecting a trajectory embedded in random-direction motion noise. Vision Research, 35, 65-77. PMID: 7839611

41. McKee, S.P. & Watamaniuk, S.N.J. (1994). The psychophysics of motion perception. In A.T. Smith and R.J. Snowden (Eds.), Visual Detection of Motion, London:Academic Press Ltd.

42. Watamaniuk, S.N.J. (1993). An ideal observer for discrimination of the global direction of dynamic random dot stimuli. Journal of the Optical Society of America A, 10, 16-28. PMID: 8478742

43. Watamaniuk, S.N.J., Grzywacz, N.M. & Yuille, A.L. (1993). Dependence of speed and direction perception on cinematogram dot density. Vision Research, 33, 849-859. PMID: 8351856

44. Watamaniuk, S.N.J. & Sekuler, R. (1992). Temporal and spatial integration in dynamic random dot stimuli. Vision Research, 32, 2341-2347. PMID: 1288010
45. Watamaniuk, S.N.J. & Duchon, A. (1992). The human visual system averages speed information. Vision Research, 32, 931-941. PMID: 1604862
46. Watamaniuk, S.N.J. (1992). Visible persistence is reduced by fixed-trajectory motion but not random motion. Perception, 21, 791-802. PMID: 1297982
47. Watamaniuk, S.N.J., Sekuler, R. & Williams, D.W. (1989). Direction perception in complex dynamic displays: the integration of direction information. Vision Research, 29, 47-59. PMID: 2773336

TECHNICAL REPORTS

1. Russell, S.M., Funke, G.J., Miller, B.T., Dukes, A., Flach, J.M., Watamaniuk, S.N.J., Strang, A.J., Menkw, L., & Brown, R. (2014). Alternative indices of performance: an exploration of eye gaze metrics in a visual puzzle task. Interum Report, AFRL (AFRL-RH-WP-TR-2014-0095).

ABSTRACTS

1. Watamaniuk, S.N.J., Singh, D., Chandna, A., Heinen, S.J. (2024). A virtual target controls fixation better than a remembered target. Vision Sciences Society Annual Meeting, St. Pete, FL, May 17-22.
2. Heinen, S.J., Chandna, A., Singh, D., & Watamaniuk, S.N.J. (2024). A covered eye follows a target on a tangent screen but doesn't point to it. Vision Sciences Society Annual Meeting, St. Pete, FL, May 17-22.
3. Watamaniuk, S.N.J., Heinen, S.J., Singh, D., & Chandna, A. (2023). Monocular viewing during fixation reveals independent smooth drift control. 2023 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2023. Online.
4. Heinen, S.J., Chandna, A., Singh, D., & Watamaniuk, S.N.J. (2023). A new binocular control model generates miniature eye movements of fixation. 2023 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2023. Online.
5. Watamaniuk, S.N.J., Heinen, S.J., Singh, D., & Chandna, A. (2023). Occluding one eye during fixation increases wandering of both eyes. Vision Sciences Society Annual Meeting, St. Pete, FL, May 19-24.
6. Heinen, S.J., Chandna, A., Singh, D., & Watamaniuk, S.N.J. (2023). A dual signal model generates minature fixational eye movements. Vision Sciences Society Annual Meeting, St. Pete, FL, May 19-24.
7. Watamaniuk, S., Badler, J., & Heinen, S. (2022). A small foveated target is not the optimal fixation stimulus. *Journal of Vision,* 22(14):3720. doi: https://doi.org/10.1167/jov.22.14.3720
8. Heinen, S., Chandna, A., Singh, D., & Watamaniuk, S. (2022). Marrying Helmholtz and Hering: A hybrid model of binocular control. *Journal of Vision,* 22(14):4171. doi: https://doi.org/10.1167/jov.22.14.4171
9. Heinen, S., Chandna, A., Singh, D., & Watamaniuk, S. (2022). A new model of binocular control demystifies the 'remarkable saccade'. 2022 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2022. Online.
10. Heinen, S., Chandna, A., Singh, D., & Watamaniuk, S. (2021). A new model of binocular eye

movement control. 2021 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2021. Online.

11. Heinen, S., Watamaniuk, S., Candy, R., Badler, J., & Chandna, A. (2020). Evidence that a single vergence command does not drive smooth pursuit in depth. Journal of Vision, 20, 1610. doi:https://doi.org/10.1167/jov.20.11.1610
12. Watamaniuk, S.N.J., Badler, J.B., & Heinen, S.J. (2019). Saccade adaptation selectively transfers to spot pursuit. Program No.108.07, 2019 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019. Online.
13. Heinen, S.J., Badler, J.B., Chandna, A., & Watamaniuk, S.N.J. (2019). Asymmetric binocular control revealed by monocular pursuit on the midline. Program No.144.19, 2019 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019. Online.
14. Watamaniuk, S.N.J., Badler, J.B., & Heinen, S.J. (2019). Saccade adaptation alters smooth pursuit velocity of small, but not large objects. Journal of Vision, 19, 252b. doi:10.1167/19.10.252b
15. Heinen, S.J., Watamaniuk, S.N.J., Candy, T.R., Badler, J.B., & Chandna, A. (2019). A covered eye does not always follow objects moving smoothly in depth. Journal of Vision, 19, 304a. doi:10.1167/19.10.304a
16. Heinen, S.J., Chandna, A., Badler, J.B., & Watamaniuk, S.N.J. (2018). Are vergence eye movements a myth? Observations from midline smooth pursuit. Program No. 60.12, 2018 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2018. Online.
17. Guthrie, B., Parikh, P., Whitlock, T., Glines, M., Wischgoll, T., Flach, J., & Watamaniuk, S. (2018). Comparing and enhancing the analytical model for exposure of a retail facility layout with human performance. Proceedings of the 2018 IISE Annual Conference, May 19-22.
18. Chandna, A., Badler, J.B., Heinen, S.J., & Watamaniuk, S.N.J. (2018). Evidence of oculomotor dominance during smooth pursuit in depth. *Investigative Ophthalmology and Visual Science,* 59(9),1016.
19. Ayres, D., Heinen, S.J., & Watamaniuk, S.N.J. (2018). An oculomotor contribution to the attentional blink. *Journal of Vision ,* 18(10),1195-1195. doi: 10.1167/18.10.1195
20. Watamaniuk, S.N.J., Badler, J.B., & Heinen, S.J. (2018). Fixating an imaginary foveal stimulus increases microsaccades. *Journal of Vision,* 18(10), 1011-1011. doi: 10.1167/18.10.1011
21. Heinen, S.J., Badler, J.B., & Watamaniuk, S.N.J. (2018). Pursuing an imaginary foveal stimulus increases catch-up saccades. *Journal of Vision*, 18(10), 377-377. doi: 10.1167/18.10.377
22. McIntire, J.P., Havig, P.R., Harrington, L.K., Wright, S.P., Watamaniuk, S.N.J., & Heft, E. (2018). Microstereopsis is Good, but Orthostereopsis is Better. SPIE: Three-Dimensional Imaging, Visualization, and Display annual meeting, Orlando, FL, April 15-19.
23. Watamaniuk, S.N.J., Badler, J., & Heinen, S.J. (2017). Foveation engages the saccadic system with or without a stimulus. Program No. 60.12, 2017 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2017. Online.
24. Heinen, S.J., Watamaniuk, S.N.J., Ma, Z. (2017). Illusory motion reveals smooth pursuit of large objects is driven by motion, not position. Program No. 59.12, 2017 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2017. Online.

25. Watamaniuk, S.N.J. & Heinen, S.J. (2017). Fixation and pursuit show similar behavior with complex stimuli. Journal of Vision, 17, 887-887. doi:10.1167/17.10.887
26. Heinen, S.J., Badler, J.B., & Watamaniuk, S.N.J. (2017). The frequency of catch-up and micro saccades reacts to and predicts stimulus events. Journal of Vision, 17, 919-919. doi:10.1167/17.10.919
27. Watamaniuk, S.N.J. & Heinen, S.J. (2016). Common motion error correction guides pursuit and fixation. Society for Neuroscience annual meeting (717.13).
28. Heinen, S.J. & Watamaniuk, S.N.J. (2016). Are catch-up saccades and microsaccades siblings? Society for Neuroscience annual meeting (717.22).
29. Watamaniuk, S.N.J., Potapchuk, E., & Heinen, S.J. (2016). Pursuing a spot engages a different mechanism than pursuing a feature on a large object. *Journal of Vision,* 16(12):1352-1352. doi: 10.1167/16.12.1352.
30. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2016). Catch-up saccades during pursuit correct position error with the help of attention. *Journal of Vision,* 16(12):1353-1353. doi: 10.1167/16.12.1353.
31. Watamaniuk, S.N.J., Potapchuk, E., & Heinen, S.J. (2015). Different mechanisms for pursuing a spot target versus a feature on a large object. Society for Neuroscience annual meeting (110.01).
32. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2015). Foveal attention amplifies a position-correcting mechanism during ocular pursuit. Society for Neuroscience annual meeting (234.06).
33. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2015). Foveal attention augments catch-up saccade frequency during smooth pursuit. *Journal of Vision,* 15(12):1020-1020. doi: 10.1167/15.12.1023.
34. Watamaniuk, S.N.J., Potapchuk, E., Bal, J. & Heinen, S.J. (2015). Interactions between fixation and pursuit systems. *Journal of Vision,* 15(12):1020-1020. doi: 10.1167/15.12.1020.
35. McIntire, J.P., Havig, P.R., Heft, E.L., Wright, S.T., Harrington, L.K., Watamaniuk, S.N.J. (2015). Optometric predictors of performance and discomfort for stereoscopic 3d precision control tasks. AsMA 86th Annual Scientific Meeting, May 10-14, Walt Disney World, FL.
36. Haggit, J., Simpson, B., Watamaniuk, S., & Gilkey, R. (2015). Cued visual search and multisensory enhancement. International Symposium on Aviation Psychology, May 6-8, Dayton, OH.
37. McIntire, J.P., Havig, P.R., Harrington, L.K., Wright, S., & Watamaniuk, S.N.J., Heft, E. (2015). Microstereopsis is good, but orthostereopsis is better: precision alignment task performance and viewer discomfort with a stereoscopic 3D display. Stereoscopic Displays and Applications XXVI, (Feb 8-12) San Francisco, CA.
38. Watamaniuk, S.N.J. & Heinen, S.J. (2014). Interspersing fixation trials better reduces anticipatory pursuit than randomizing target direction. Society for Neuroscience (626.10).
39. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2014). Foveal attention modulates saccade frequency during smooth pursuit. Society for Neuroscience annual meeting (626.04).
40. Watamaniuk, S.N.J. & Heinen, S.J. (2014). Attention allocation during pursuit is broad and

symmetric, but can be limited by set size and crowding. Journal of Vision, 14(10): 497; doi:10.1167/14.10.497.

41. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2014). Small foveal stimuli render smooth pursuit less smooth. Journal of Vision, 14(10): 494; doi:10.1167/14.10.494.
42. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2014). Small foveal stimuli are not ideal smooth pursuit targets. Applied Vision A Annual meeting, University of York, UK, April 11.
43. Watamaniuk, S.N.J. & Heinen, S.J. (2013). Stimulus configuration shapes the attentional spotlight during smooth pursuit. Society for Neuroscience annual meeting (363.13).
44. Heinen, S.J. & Watamaniuk, S.N.J. (2013). Smooth pursuit is penalized by small spot stimuli. Society for Neuroscience annual meeting (363.14).
45. Maus, G., Potapchuk, E., Watamaniuk, S. & Heinen, S.J. (2013). Opposite effects of adaptation and priming: Speed discriminations during smooth pursuit. Perception, 42, ECVP Abstract Supplement, page 184. Paper presented at the 36th annual European Conference on Visual Perception, Bremen, Germany.
46. Watamaniuk, S.N.J., Jin, Z., Potapchuk, E., & Heinen, S.J. (2013). Attentively segregated moving elements are effortlessly integrated to drive pursuit. [Abstract]. *Journal of Vision, 13(9): 387; doi:10.1167/13.9.387.* Paper presented at the Visual Sciences Society Annual Meeting, Naples, FL.
47. Heinen, S.J., Potapchuk, E., & Watamaniuk, S.N.J. (2013). Smooth pursuit "go" circuitry is affected by priming, "nogo" circuitry by cognitive expectation. [Abstract]. *Journal of Vision, 13(9): 388; doi:10.1167/13.9.388.* Paper presented at the Visual Sciences Society Annual Meeting, Naples, FL.
48. Heinen, S.J., Jin, Z., & Watamaniuk, S.N.J. (2012). Attention modulates anticipatory eye movements [Abstract]. *Journal of Vision, 12(9),995; doi:* 10.1167/12.9.995. Paper presented at the Visual Sciences Society Annual Meeting, Naples, FL.
49. Watamaniuk, S.N.J., Jin, Z., & Heinen, S.J. (2012). Attention for saccades and foveal pursuit is shared [Abstract]. *Journal of Vision, 12(9),998; doi:* 10.1167/12.9.998. Paper presented at the Visual Sciences Society Annual Meeting, Naples, FL.
50. Heinen, S.J., Jin, Z., & Watamaniuk, S.N.J. (2011). Anticipatory eye velocity is diminished with a large random-dot pursuit stimulus. Society for Neuroscience annual meeting (490.07).
51. Watamaniuk, S.N.J., Jin, Z., & Heinen, S.J. (2011). Shared attention for saccades and foveal pursuit. Society for Neuroscience annual meeting (18.08).
52. Gabbard, S.R. & Watamaniuk, S.N.J. (2011). Referee offside decisions: the nature of expert decisions in moving position determination and the flash lag effect. Invited presentation at The 10th International Conference on Naturalistic Decision Making, Orlando, FL.
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INVITED PRESENTATIONS

"An explanation for overlapping saccade and pursuit architecture", The Smith-Kettlewell Eye Research Institute, San Francisco, CA June 27, 2019.

"Monocular viewing during midline smooth pursuit disrupts the vergence system", Bay Area Strabismus Club meeting, San Francisco, CA June 19, 2019.

"Creating Reality: What visual illusions tell us about how the brain works", Wright State University Pub Science, Dayton, OH October 5, 2018.

“Foveal stimuli penalize smooth pursuit eye movements: different mechanisms for the ocular pursuit of large and small stimuli”, University of Adelaide, South Australia, Australia February 1, 2015.

“Multiple-object tracking (MOT) during smooth pursuit: Simultaneous integration and segregation”, The Smith-Kettlewell Eye Research Institute, San Francisco, CA April 11, 2013.

“Attentive multiple-object tracking while making smooth pursuit eye movements”, University of Adelaide, South Australia, Australia October 26, 2012.

“Perceiving depth in unstructured moving stimuli”, University of Dayton, Dayton, OH December 1, 2006.

“Processing visual motion: An advantage for realistic/slowly changing trajectories (Subtitle: Why is it so hard to swat a fly)”, Denison University, Granville, OH November 13, 2006.

“In pursuit of the waterfall effect: Pursuit eye movements after motion adaptation”, The Smith-Kettlewell Eye Research Institute, San Francisco, CA June 10, 2004.

“Processing motion information: An advantage for realistic trajectories”, North Dakota State University, February 3, 2001.

“Processing motion information: An advantage for realistic trajectories”, Purdue University, March 29, 2000.

“Motion psychophysics: Probing the visual input for smooth pursuit”, The Smith-Kettlewell Eye Research Institute, San Francisco, CA June 24, 1999.

“Can the Poggendorff Configuration be used to Study Motion Trajectory Networks?”, The Smith-Kettlewell Eye Research Institute, San Francisco, CA June 17, 1998.

“New perspective on human smooth pursuit eye movements”, Ohio State University, OH, February 20, 1997.

“New thoughts on human smooth pursuit eye movements”, Miami University, Oxford, OH, February 9, 1996.

"Surface segregation based on speed", Stanford University, Stanford, CA, April, 1995.

"The encoding of global and local motion", University of Alberta, Edmonton, Alberta, Canada, June 1991.

"Motion Information: Its Integration and Loss", University of Rochester, Rochester, NY., July 1989.

"What gives rise to the perception of motion?", MIT, Cambridge, MA., September 1988.

GRANTS

"Cortical and Brainstem Contributions to Binocular Eye Movements", National Institutes of Health Grant **#1 RO1 EY034626**. $1,985,885 (WSU budget: $506,635), July 1, 2023-June 30, 2027. Co-PI with Dr. S. Heinen.

"Attention Allocation for Voluntary Smooth Eye Movements", National Institutes of Health Grant **#1 1R01EY021286-02**, $997,200 (WSU budget: $303,754), Jan 1, 2012-Dec 31, 2014. Co-PI with Dr. S. Heinen.

"Motion Detector Networks for Smooth Pursuit", National Institutes of Health Grant **#3 RO1 EY013886-03S1**, $35,200, August 1, 2005-July 31, 2006. Co-PI with Dr. S. Heinen.

"Motion Detector Networks for Smooth Pursuit", National Institutes of Health Grant **#1 RO1 EY013886-01A1**, $1,132,692 (WSU budget: $285,080), August 1, 2003-July 31, 2007. Co-PI with Dr. S. Heinen. **funded**.

Research Supplies Award (Brain Voyager software), Wallace-Kettering Neuroscience Institute, $5,339, Dec 1, 2003.

"Motion Detector Networks for Smooth Pursuit", Research Challenge Early Start/Augmentation - Ohio Board of Regents, $7, 627, Dec 1, 2002 - Dec 31, 2003.

"Trajectory Networks in Human Motion Perception", National Science Foundation, $146,808, March 1, 2000-Feb. 28, 2004.

"Motion Processing Limitations on Human Smooth Pursuit", Research Challenge Early Start/ Augmentation - Ohio Board of Regents, $12, 246, Jan 4, 2000-Dec 31, 2002.

"Integrating motion at different spatial scales", Research Incentive Grant - Ohio Board of Regents, May 31, 1997-June 30, 1999, $8,000.

"Motion processing and Smooth Pursuit Eye Movements", Research Challenge Grant - Ohio Board of Regents, June 1996-June 1998, $21,000.

"Visual Motion Processing for Smooth Pursuit", National Institutes of Health Grant **#1 RO1 EY10838-01A1**, July 1, 1995-June 30, 1998, $522,000. Co-PI with Dr. S. Heinen.

CONTRACTS

Service Agreement for "OPTICS", Kairos Research Inc., Nov 2023-April 2025, Co-PI with Ion Juvina. $200,000.

Service Agreement for "Virtual Reality Laser Dazzle Demonstrator". SBIR Direct to Phase II, Aptima Inc., Aug 2023-July 2025, $60,000.

Service Agreement for development of "CLEAR, an Augmented Reality software platform". P-9997-467 SBIR Direct to Phase II, Aptima Inc., March 2018-Feb 2021, $15,000.

Service Agreement for "System acquisition guidance from expert systems (SAGES)". AF112-019-1447 SBIR Phase II Extension, Aptima Inc., Jan 2017-Aug 2017, $20,000.

Service Agreement for "Proactive and Retroactive interference in intuitive spatial learning". AFRL, Oct 2013-Oct 2015, $70,346.

Service Agreement for "System acquisition guidance from expert systems (SAGES)". AF112-019-1447 SBIR Phase II, Aptima Inc., March 2013-Feb 2015, $60,000.

Service Agreement for “Visual identification of human biosignatures via pattern recognition-based decision making in immersive environments”. Infoscitex, Oct 2012-Oct 2013, $36,500 (subcontract: 5002-S002).

Service Agreement for “System acquisition guidance from expert systems (SAGES)”. AF112-019-1447 SBIR Phase I, Aptima Inc., Jan 2012-Sept 2012, $8,562.

Service Agreement for “Visual identification of human biosignatures via pattern recognition-based decision making in immersive environments”. Infoscitex, Oct 2011-Oct 2012, $51,100 (subcontract: 5002-S002).

Service Agreement for a research report on helicopter pilot problems (A988), Flightsafety International, Visual Simulation Systems, Nov-Dec 2006, $1985.