Alexander A. Petrov

Curriculum Vitae

Department of Psychology
Ohio State University
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Employment

- **Associate Professor.** 2012 – present
  Department of Psychology, Ohio State University, Columbus, OH, USA
- **Assistant Professor.** 2006 – 2012
  Department of Psychology, Ohio State University, Columbus, OH, USA

Education

- **M.S. & B.S. in Computer Science.** 1995. Sofia University, Sofia, Bulgaria.
  Magna cum laude.
- **Ph.D. & M.S. in Cognitive Science.** 1998. Central and East-European Center for Cognitive Science, New Bulgarian University. Sofia, Bulgaria.
  Thesis: *A dynamic emergent computational model of analogy-making based on decentralized representations.* Advisor: Boicho N. Kokinov.
- **Post-doctoral Fellow.** 1998 – 2001. Supervisor: John R. Anderson.
  Department of Psychology, Carnegie Mellon University, Pittsburgh, PA, USA.
- **Post-doctoral Fellow.** 2001 – 2005. Supervisor: Barbara A. Dosher.
  Department of Cognitive Science, University of California, Irvine, CA, USA.
- **Post-doctoral Fellow.** 2005 – 2006. Supervisor: Randall C. O'Reilly.
  Department of Psychology, University of Colorado, Boulder, CO, USA.

Selected Publications

- Sawada, T. & **Petrov, A. A.** (2017). The divisive-normalization model of V1 neurons: A comprehensive comparison of physiological data and model predictions. *Journal of Neurophysiology*. E-pub ahead of print, doi:10.1152/jn.00821.2016.
- Hayes, T. R. & **Petrov, A. A.** & Sederberg, P. B. (2015). Do we really become smarter when our fluid-intelligence scores improve? *Intelligence, 48* (1), 1–14.
- **Petrov, A. A.** & Hayes, T. (2010). Asymmetric transfer of perceptual learning of luminance- and contrast-modulated motion. *Journal of Vision, 10* (14): 11, 1–22.
- **Petrov, A. A.** & Anderson, J. R. (2005). The dynamics of scaling: A memory-based anchor model of category rating and absolute identification. *Psychological Review, 112* (2), 383–416.
- **Petrov, A. A.**, Dosher, B. A., & Lu, Z.-L. (2005). The dynamics of perceptual learning: An incremental reweighting model. *Psychological Review, 112* (4), 715–743.

Funding

- Biologically-Inspired Cognitive Architectures, Co-Investigator on DARPA Grant 05185052, Oct 2005–Oct 2006, $229,532 direct costs.
- A computational cognitive neuroscience model of complex perceptual skill learning. 07/01/2012 – 06/30/2014, NIH R21 EY022745-01, $275,000 direct costs, PI.

Books

- **Petrov, A. A.** (2013). *Associative Memory-Based Reasoning: A Computational Model of Analogy-Making in a Decentralized Multi-Agent Cognitive Architecture*. Saarbrücken, Germany: LAP Lambert Academic Publishing. ISBN 978-3-659-26248-7.

Peer-Reviewed Publications (complete chronological list)

1. Alexandrova, B., Terzieva, M., **Petrov, A. A.,** Tarnev, I. & Mavlov, L. (1996). [A study on visuo-perceptive and imagery abilities—I. Assessment of visuo-perceptive abilities.] (In Bulgarian). *Bulgarian Journal of Psychology, 3*, 76–91.

2. Terzieva, M., Alexandrova, B., **Petrov, A. A.,** Tarnev, I. & Mavlov, L. (1996). [A study on visuo-perceptive and imagery abilities—II. Assessment of visual mental image generation and transformation.] (In Bulgarian). *Bulgarian Journal of Psychology, 4*.

3. Kokinov, B., Nikolov, V. & **Petrov, A. A.** (1996). Dynamics of emergent computation in DUAL. In A. Ramsay (Ed.), *Artificial Intelligence: Methodology, Systems, Applications* (pp. 303–311). Amsterdam: IOS Press.

4. **Petrov, A. A.** & Kokinov, B. (1998). Mapping and access in analogy-making: Independent or interactive? A Simulation Experiment with AMBR. In K. Holyoak, D. Gentner, & B. Kokinov (Eds.), *Advances in analogy research: Integration of theory and data from the cognitive, computational, and neural sciences* (pp. 124–134). Sofia: NBU Press.

5. **Petrov, A. A.** & Kokinov, B. (1999). Processing symbols at variable speed in DUAL: Connectionist activation as power supply. In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence* (vol. 2, pp. 846–851).

6. **Petrov, A. A.** & Anderson, J. R. (2000). ANCHOR: A memory-based model of category rating. In L.R. Gleitman & A.K. Joshi (Eds.), *Proceedings of the Twenty-Second Annual Conference of the Cognitive Science Society* (pp. 369–374). Hillsdale, NJ: LEA.

7. Kokinov, B. & **Petrov, A. A.** (2000). Dynamic extension of episode representation in analogy-making in AMBR. In *Proceedings of the Twenty-Second Annual Conference of the Cognitive Science Society* (pp. 274–279). Hillsdale, NJ: LEA.

8. **Petrov, A. A.** (2001). Fitting the ANCHOR model to individual data: A case study in Bayesian methodology. In E.M. Altmann, A. Cleermans, C.D. Schunn, & W.D. Gray (Eds.), *Proceedings of the Fourth International Conference on Cognitive Modeling* (pp. 175–180). Mahwah, NJ: LEA.

9. Kokinov, B. N. & **Petrov, A. A.** (2001). Integrating memory and reasoning in analogy-making: The AMBR model. In D. Gentner, K. Holyoak, & B. Kokinov (Eds.), *The analogical mind: Perspectives from cognitive science* (pp. 59–124). Cambridge, MA: MIT Press.

10. Petrov, A. A. (2003). Additive or multiplicative perceptual noise? Two equivalent forms of the ANCHOR model. In *Proceedings of the Twenty-Fifth Annual Conference of the Cognitive Science Society* (pp. 922–927). Hillsdale, NJ: LEA.

11. **Petrov, A. A.** & Anderson, J. R. (2005). The dynamics of scaling: A memory-based anchor model of category rating and absolute identification. *Psychological Review, 112* (2), 383–416.

12. **Petrov, A. A.**, Dosher, B. A., & Lu, Z.-L. (2005). The dynamics of perceptual learning: An incremental reweighting model. *Psychological Review, 112* (4), 715–743.

13. **Petrov, A. A.**, Dosher, B. A., & Lu, Z.-L. (2006). Perceptual learning without feedback in non-stationary contexts: Data and model. *Vision Research, 46* (19), 3177–3197.

14. **Petrov, A. A.** (2006). Computationally efficient approximation of the base-level learning equation in ACT-R. In D. Fum, F. del Missier, & A. Stocco (Eds.) *Proceedings of the Seventh International Conference on Cognitive Modeling* (pp. 391–392). Trieste, Italy: Edizioni Goliardiche.

15. **Petrov, A. A.** (2008a). Additive or multiplicative perceptual noise? Two equivalent forms of the ANCHOR model. *Journal of Social & Psychological Sciences, 1* (2), 123–143.

16. **Petrov, A. A.** (2008b). Relational priming plays a supporting but not leading role in adult analogy-making. *Behavioral and Brain Sciences, 31* (4), 392–393.

17. **Petrov, A. A.** (2009). Symmetry-based methodology for decision-rule identification in *same–different* experiments. *Psychonomic Bulletin & Review, 16* (6), 1011–1025.

18. Jeter, P. E., Dosher, B. A., **Petrov, A.**, & Lu, Z.-L. (2009). Task precision at transfer determines specificity of perceptual learning. *Journal of Vision, 9* (3:1), 1–13, http://www.journalofvision.org/9/3/1/

19. **Petrov, A. A.**, Jilk, D. J., & O'Reilly, R. C. (2010). The *Leabra* architecture: Specialization without modularity. *Behavioral and Brain Sciences, 33*(4), 286–287.

20. **Petrov, A. A.** & Hayes, T. R. (2010). Asymmetric transfer of perceptual learning of luminance- and contrast-modulated motion. *Journal of Vision, 10* (14:11), 1–22, http://www.journalofvision.org/10/14/11/

21. **Petrov, A. A.** (2011). Category rating is based on prototypes and not instances: Evidence from feedback-dependent context effects. *Journal of Experimental Psychology: Human Perception and Performance, 37* (2), 336–356.

22. **Petrov, A. A.,** Van Horn, N. M., & Ratcliff, R. (2011). Dissociable perceptual-learning mechanisms revealed by diffusion-model analysis. *Psychonomic Bulletin & Review, 18*, 490–497.

23. Hayes, T. R., **Petrov, A. A.**, & Sederberg, P. B. (2011). A novel method for analyzing sequential eye movements reveals strategic influence on Raven's Advanced Progressive Matrices. *Journal of Vision, 11* (10:10), 1–11, http://www.journalofvision.org/11/10/10/

24. **Petrov, A. A.,** Van Horn, N. M. & Todd, J. T. (2011). The visual identification of relational categories. *Journal of Vision, 11* (12:11), 1–11, http://www.journalofvision.org/11/12/11/

25. **Petrov, A. A.** & Van Horn, N. M. (2012). Motion aftereffect duration is not changed by perceptual learning: Evidence against the representation modification hypothesis. *Vision Research, 61*, 4–14.

26. O'Reilly, R. C., **Petrov, A. A.**, Cohen, J. D., Lebiere, C. J., Herd, S. A., & Kriete, T. (2014). How limited systematicity emerges: A computational cognitive neuroscience approach. In Paco Calvo & John Symons (Eds.), *The architecture of cognition: Rethinking Fodor and Pylyshyn's Systematicity Challenge* (pp. 191-226). Cambridge, MA: MIT Press.

27. Hayes, T. R. & **Petrov, A. A.** & Sederberg, P. B. (2015). Do we really become smarter when our fluid-intelligence scores improve? *Intelligence, 48* (1), 1–14.

28. Sawada, T. & **Petrov, A. A.** (2015). A study of the role of the maintained-discharge parameter in the divisive normalization model of V1 neurons. In J. Suzuki, T. Nakano, & H. Hess (Eds.) *Proceedings of the First International Workshop on Computational Models of the Visual Cortex: Hierarchies, Layers, Sparsity, Saliency and Attention* (pp. 1–4). New York: ACM. doi:0.4108/eai.3-12-2015.2262400

29. Hayes, T. R. & **Petrov, A. A.** (2016). Mapping and correcting the influence of gaze position on pupil size measurements. *Behavior Research Methods, 48* (2), 510–527. doi:10.3758/s13428-015-0588-x. [Received the 2016 Clifford T. Morgan Best Article Award by the Psychonomic Society http://www.psychonomic.org/page/2016_ctmorgan]

30. Hayes, T. R. & **Petrov, A. A.** (2016). Pupil diameter tracks the exploration-exploitation tradeoff during analogical reasoning and explains individual differences in fluid intelligence. *Journal of Cognitive Neuroscience, 28* (2), 308-318.

31. Sawada, T. & **Petrov, A. A.** (2017). The divisive-normalization model of V1 neurons: A comprehensive comparison of physiological data and model predictions. *Journal of Neurophysiology, 118* (6), 3051-3091. doi:10.1152/jn.00821.2016.

Manuscripts Under Review or In Preparation

- Hayes, T. R. & **Petrov, A. A.** (in preparation). Learning is in the eye of the beholder: Phasic pupil diameter systematically decreases during perceptual learning.
- **Petrov, A. A.** & Huang, T.-R., & O'Reilly, R. C. (in preparation). A learning neural model of systems-level interactions in analogical mapping.

Abstracts, Posters, and Technical Reports

1. Andonova, E., Gerganov, E., **Petrov, A. A.** & Misheva, A. (1996). *Sentence interpretation in Bulgarian*. (Tech. Rep. No. NBU-COG-96-1). Sofia: New Bulgarian University, Cognitive Science Department.
2. **Petrov, A. A.** (1998). *A dynamic emergent computational model of analogy-making based on decentralized representations.* Doctoral dissertation, New Bulgarian University, Sofia. [Ph.D. committee: Boicho Kokinov (chair), Encho Gerganov, Dedre Gentner, Kenneth Forbus, John Hummel, Pentti Kanerva, Zdravko Markov]
3. **Petrov, A. A.,** Dosher, B. A., & Lu, Z.-L. (2003). A computational model of perceptual learning through incremental channel re-weighting predicts switch costs in non-stationary contexts [Abstract]. In *Proceedings of the Fifth UCI Neuroscience Symposium* (abstract 25). University of California, Irvine.
4. **Petrov, A. A.,** Dosher, B. A., & Lu, Z.-L. (2003). A computational model of perceptual learning through incremental channel re-weighting predicts switch costs in non-stationary contexts [Abstract]. *Journal of Vision, 3*(9), 670a, http://journalofvision.org/3/9/670/
5. **Petrov, A. A.** (2003). ANCHOR: A dynamic, memory-based model of psychophysical scaling. [Abstract]. *Abstracts of the Psychonomic Society, 8*, 4111.
6. **Petrov, A. A.** (2004). The Dynamics of Direct Psychophysical Scaling: A Memory-Based Model. [Abstract]. In *Proceedings of the 37th Annual Meeting of the Society for Mathematical Psychology.*
7. **Petrov, A. A.** (2004). Nonstationary response distribution: A telltale sign of the dynamics of category rating. [Abstract]. *Abstracts of the Psychonomic Society, 9*, 4097.
8. **Petrov, A. A.,** Dosher, B. A., & Lu, Z.-L. (2004). Comparable perceptual learning with and without feedback in non-stationary contexts: Data and model [Abstract]. *Journal of Vision, 4*(8), 306a, http://journalofvision.org/4/8/306/
9. **Petrov, A. A.** (2005). Bayesian method for repeated threshold estimation. [Abstract]. In *Proceedings of the 38th Annual Meeting of the Society for Mathematical Psychology.*
10. **Petrov, A. A.,** Dosher, B. A., & Lu, Z.-L. (2005). Perceptual learning through Hebbian reweighting: Data and model [Abstract]. In *Proceedings of the 2005 Computational Neuroscience Conference.*
11. Jeter, P., Dosher, B. A., **Petrov, A. A.,** & Lu, Z.-L. (2005). Identical transfer of perceptual learning following easy and difficult task training [Abstract]. *Journal of Vision, 5*(8), 710a, http://www.journalofvision.org/5/8/710/
12. **Petrov, A. A.** (2006). Bayesian method for repeated threshold estimation. [Abstract]. *Journal of Vision, 6*(6), 167, http://www.journalofvision.org/6/6/167/
13. **Petrov, A. A.** & O'Reilly, R. (2006). Generalization and interference in perceptual learning: A selective-reweighting model. [Abstract]. In *Proceedings of the 2006 Computational Cognitive Neuroscience Conference*, V-29.

14. **Petrov, A. A.** (2008). The dynamics of perceptual learning in non-stationary contexts: Data and model [Abstract]. In *Proceedings of the 33rd Annual Interdisciplinary Conference.*

15. **Petrov, A. A.** (2008). Single-interval and Same/Different discrimination tasks yield consistent estimates of perceptual learning of visual motion. [Abstract]. *Abstracts of the Psychonomic Society, 13*, 289.

16. **Petrov, A. A.** (2009). The stimulus specificity of motion perceptual learning depends on the difficulty during post-test rather than training. [Abstract]. *Journal of Vision, 9*(8), 885a, http://www.journalofvision.org/9/8/885/

17. **Petrov, A. A.** (2009). The stimulus specificity of motion perceptual learning depends on the difficulty during post-test rather than training. [Abstract]. *Abstracts of the Psychonomic Society, 14*, 5093.

18. Hayes, T. & **Petrov, A. A.** (2009). Asymmetrical transfer of perceptual learning from luminance- to contrast-modulation motion: Evidence for shared and distinct processing. [Abstract]. *Abstracts of the Psychonomic Society, 14*, 5095.

19. Hayes, T. & **Petrov, A. A.** (2009). Perceptual learning transfers from luminance- to contrast-defined motion. [Abstract]. *Journal of Vision, 9* (8), 884a, http://www.journalofvision.org/9/8/884/

20. Van Horn, N. & **Petrov, A. A.** (2009). Motion aftereffect duration is not changed by perceptual learning: Evidence against the representation-modification hypothesis. [Abstract]. *Abstracts of the Psychonomic Society, 14*, 5094.

21. Van Horn, N. & **Petrov, A. A.** (2009). Perceptual learning of visual motion: The role of the spatial frequency of the carrier. [Abstract]. *Journal of Vision, 9*(8), 886a, http://www.journalofvision.org/9/8/886/

22. **Petrov, A. A.** (2010). The stimulus specificity of motion perceptual learning does not arise from stimulus-specific improvements in visual memory or changes of decision strategy. [Abstract]. *Journal of Vision, 10* (7): 1141, http://www.journalofvision.org/10/7/1141/

23. **Petrov, A. A.** (2010). Symmetry-based methodology for decision-rule identification in *Same-Different* experiments. [Abstract]. In *Proceedings of the 43rd Annual Meeting of the Society for Mathematical Psychology.*

24. **Petrov, A. A.**, Van Horn, N. M., & Ratcliff, R. (2010). Dissociable perceptual learning mechanisms revealed by diffusion-model analysis. [Abstract]. *Abstracts of the Psychonomic Society, 15*, 218.

25. **Petrov, A. A.** (2011a). Models of perceptual learning: Combining psychophysics, computation, and neuroscience [Symposium abstract]. *Journal of Vision, 11* (11): 6, http://www.journalofvision.org/content/11/11/6

26. **Petrov, A. A.** (2011b). A selective-reweighting model of perceptual learning [Abstract]. *Journal of Vision, 11* (11): 8, http://www.journalofvision.org/content/11/11/8

27. **Petrov, A. A.**, Hayes, T., & Sederberg, P. (2011). Learning affects strategic processing on Raven's Advanced Progressive Matrices [Abstract]. *Proceedings of the 2011 Annual Conference of the Cognitive Science Society*.

28. **Petrov, A. A.**, Hayes, T., & Sederberg, P. (2011). A novel method for the analysis of sequential eye movements [Abstract]. *Proceedings of the 44th Annual Meeting of the Society for Mathematical Psychology*.

29. **Petrov, A. A.**, Hayes, T., & Sederberg, P. (2011). Sequential eye-movement analysis reveals strategic processing on Raven's Advanced Progressive Matrices [Abstract]. *Abstracts of the Psychonomic Society, 16*.

30. **Petrov, A. A.**, Van Horn, N. M., & Ratcliff, R. (2011). Dissociable perceptual learning mechanisms revealed by diffusion-model analysis. [Abstract]. *Journal of Vision, 11* (11): 993, http://www.journalofvision.org/content/11/11/993

31. Hayes, T., Sederberg, P., & **Petrov, A. A.** (2011). A new technique for the analysis of sequential eye movements [Abstract]. *Journal of Vision, 11* (11): 501, http://www.journalofvision.org/content/11/11/501

32. Meyer, J. & **Petrov, A. A.** (2011). The specificity of perceptual learning of pop-out detection depends on the difficulty during post-test rather than training [Abstract]. *Journal of Vision, 11* (11): 1025, http://www.journalofvision.org/content/11/11/1025

33. Van Horn, N. M., **Petrov, A. A.**, & Todd, J. T. (2011). Can configural relations be encoded by image histograms of higher-order filters? [Abstract]. *Journal of Vision, 11* (11): 852, http://www.journalofvision.org/content/11/11/852

34. **Petrov, A. A.** (2012a). A dual process model of perceptual learning [Abstract]. *Journal of Vision, 12* (9): 769, http://www.journalofvision.org/content/12/9/769

35. **Petrov, A. A.** (2012b). A dual process model of perceptual learning [Abstract]. *Abstracts of the Psychonomic Society.*

36. Hayes, T. & **Petrov, A. A.** (2012a). Pupil diameter changes non-monotonically with perceptual learning [Abstract]. *Journal of Vision, 12* (9): 697, http://www.journalofvision.org/content/12/9/697

37. Hayes, T. & **Petrov, A. A.** (2012b). Pupil diameter changes non-monotonically with perceptual learning [Abstract]. *Abstracts of the Psychonomic Society.*

38. Meyer, J. & **Petrov, A. A.** (2012). A regression based method for time series analysis of perceptual learning data [Abstract]. *Proceedings of the Twelfth Annual Meeting of the Vision Sciences Society*, 56.319.

39. **Petrov, A. A.** (2013). An optimal read-out model of perceptual learning: How to measure talk difficulty and learning specificity in a principled manner [Abstract]. *Journal of Vision, 13* (9): 244, doi: 10.1167/13.9.244.

40. Hayes, T. R. & **Petrov, A. A.** (2013a). Phasic Locus Coeruleus activity changes with practice: A pupillometry study [Abstract]. *Proceedings of the 2013 Computational and Systems Neuroscience (Cosyne) Conference*.

41. Hayes, T. R. & **Petrov, A. A.** (2013b). Pupillometry as a method for tracking shifts in control state during visual relational reasoning [Abstract]. *Journal of Vision, 13* (9): 799, doi: 10.1167/13.9.799.
42. Van Horn, N. M. & **Petrov, A. A.** (2013). Cross-talk between visual short-term memory and low-level vision: Evidence for interactions across shared neural resources [Abstract]. *Journal of Vision, 13* (9): 11, doi: 10.1167/13.9.11.
43. **Petrov, A. A.**, Huang, T.-R., & O'Reilly, R. C. (2013). Analogical mapping with nonstationary inputs: A neural model with learned coarse-coded conjunctive distributed representations. *Proceedings of the Third International Conference on Analogy*. Dijon, France.
44. **Petrov, A. A.** & Van Horn, N. M. (2014). Training on orientation recall improves the precision of visual short-term memory under high and low levels of memory masking [Abstract]. *Journal of Vision, 14* (10): 1373, doi: 10.1167/14/10/1373.
45. Hayes, T. R., Sederberg, P. B., Siefke, B. M., & **Petrov, A. A.** (2014). Pupillometry reveals role for norepinephrine in the isolation effect [Abstract]. *Journal of Vision, 14* (10): 1142, doi: 10.1167/14/10/1142.
46. Sawada, T. & **Petrov, A. A.** (2014). A Unified Computational Model of Primary Visual Cortex: Consolidation of the Scattered Literature on Simple and Complex Cells [Abstract]. *Journal of Vision, 14* (10): 1189, doi: 10.1167/14/10/1189.
47. Van Horn, N. M. & **Petrov, A. A.** (2014). Practice abolishes similarity's influence on VSTM-induced interference on perception [Abstract]. *Journal of Vision, 14* (10): 156, doi: 10.1167/14/10/156.
48. Hayes, T. R. & **Petrov, A. A.** (2015). Mapping and correcting the influence of gaze position on pupil size measurements [Abstract]. *Journal of Vision, 15* (12): 781, doi:10.1167/15.12.781.
49. Van Horn, N. M. & **Petrov, A. A.** (2015). An equivalent noise method for measuring delay-induced degradation in VSTM [Abstract]. *Journal of Vision, 15* (12): 660, doi:10.1167/15.12.660.
50. Sawada, T. & **Petrov, A. A.** (2016a). Identifying Falsifiable Predictions of the Divisive Normalization Model of V1 Neurons [Abstract]. In *Proceedings of the 2016 MODVIS Workshop: Computational and Mathematical Models in Vision*, St. Pete Beach, FL. http://docs.lib.purdue.edu/modvis/2016/session06/2/
51. Sawada, T. & **Petrov, A. A.** (2016b). Emulating and predicting physiological results of neurons in the primary visual cortex (V1) based on the divisive normalization model [Abstract]. *Journal of Vision, 16* (12): 958, doi: 10.1167/16.12.958.
52. Yu, Y. & **Petrov, A. A.** (2016). Distortions of perceived metric structure of a symmetric planar object rotating in depth [Abstract]. *Journal of Vision, 16* (12): 653, doi: 10.1167/16.12.653.
53. Nartker, M., Todd, J. T., & **Petrov, A. A.** (2017). Distortions of apparent 3D shape from shading caused by changes in the direction of illumination [Abstract]. *Journal of Vision, 17* (10): 323, doi: 10.1167/17.10.324.
54. **Petrov, A. A.**, Huang, T.-R., & O'Reilly, R. C. (2017). From object-feature binding to role-filler binding: A neural-network model of analogical mapping grounded in visual

cognition. *Proceedings of the Fourth International Conference on Analogy*. Paris, France.

55. Yu, Y., **Petrov, A. A.**, & Todd, J. T. (2017). Non-veridical depth perception causes symmetric 3D objects to appear asymmetric, and vice versa [Abstract]. *Journal of Vision, 17* (10): 323, doi: 10.1167/17.10.323.

Scholarships and Awards

Golden medal from the National High School of Mathematics and Science, Sofia (1987).

Merit-based scholarship from Sofia University (1989-94).

TEMPUS Mobility Grant supporting a visit to Hamburg University, Germany (1996).

Open Society Fund Scholarship covering tuition at New Bulgarian University (1992-97).

Grigor Parlichev Award for outstanding achievements at New Bulgarian Univ. (1997).

Conference presentation grants from Carnegie Mellon University (1999, 2000).

"Extraordinary Ability" status by the U.S. Citizenship and Immigration Services (2002).

Clifford T. Morgan Best Article of the Year award for our paper (Hayes & Petrov, 2016) titled *Mapping and correcting the influence of gaze position on pupil size measurements*.

Additional Education

- **TEMPUS mobility grant.** May–July 1996. Study period at Hamburg University, Germany. Financed by the TEMPUS program of the European Union.
- **Data mining and machine learning for professionals.** 1999. Summer school at the Center for Automated Learning and Discovery, Carnegie Mellon University.

Teaching Experience

Analogy and Relational Reasoning: Data and Models (PSY 811). Instructor. Multiple sections, 2010–present. Graduate course, Ohio State University, Columbus, OH.

Introduction to Cognitive Science (PSY 5612). Instructor. Multiple sections,2007–present. Graduate/advanced undergraduate course, Ohio State University, Columbus, OH.

Memory and Cognition (PSY 3312). Instructor. Multiple sections, 2007–present. Undergraduate course, Ohio State University, Columbus, OH.

Introduction to Computational Cognitive Neuroscience (PSY 618/5618). Instructor. Multiple sections, 2010–present. Graduate/advanced undergrad course, Ohio State University, Columbus, OH.

Human Learning I/II (PSY 877/878). [Precursor to Psych 618/5618.] Instructor. Multiple sections, 2007–2009. Graduate course, Ohio State University, Columbus, OH.

Introduction to Computational Cognitive Neuroscience. Instructor. July 2007. Intensive graduate course, 14th International Summer School in Cognitive Science, New Bulgarian University, Sofia, Bulgaria.

Introduction to the Leabra Framework for Computational Cognitive Neuroscience. February 2006. Three-day tutorial, Carnegie Mellon University, Pittsburgh, PA.

Perceptual Learning from a Connectionist Perspective. March 2004. Invited lecture for a graduate course, University of Southern California, Los Angeles, CA.

Behavior-Based Robotics. July 2002. Invited lecture for a graduate course, New Bulgarian University, Sofia, Bulgaria.

Principles of Learning in Humans and Machines. Instructor. July 2000. Intensive graduate course, Seventh International Summer School in Cognitive Science, New Bulgarian University, Sofia, Bulgaria.

Computer Skills and Text Processing. Instructor. Multiple sections, 1996–1998. Undergraduate course, New Bulgarian University, Sofia, Bulgaria.

Experiment Design and Programming in PsyScope. Instructor. Spring 1997. Undergraduate course, New Bulgarian University, Sofia, Bulgaria.

Computer and Technical Experience

Programming languages: Matlab, R, Python, C++, Common Lisp, Prolog.

Software development: cognitive architecture DUAL (10,000+ lines of Lisp code); Matlab implementation of several complex mathematical models and dozens of psychophysical experiments with controlled stimulus presentations (PsychToolbox).

Research Programmer. 1994–1998, part time. Central and East-European Center for Cognitive Science, New Bulgarian University, Sofia, Bulgaria.

Research Programmer. 1991–1994, part time. Institute of Mathematics and Informatics, Bulgarian Academy of Science, Sofia, Bulgaria.

Radio and Telegraph Operator. 1987–1989. Mandatory service in the Bulgarian Army.

Invited Lectures and Colloquia

The 4th International Workshop on Perceptual Learning, Jongny, Switzerland, Aug 2014.

University of Iowa, Iowa City, IA, Delta Center, Oct 2011.

The 2nd International Workshop on Perceptual Learning, Eilat, Israel, Dec 2010.

University of California, Riverside, CA, Department of Psychology, Nov 2010.

University of Texas, Austin, TX, Department of Psychology, Oct 2010.

Indiana University, Bloomington, IN, Dept. of Psychological and Brain Sci, March 2008.

Ohio State University, Neural Mechanisms of Decision Making Workshop, Sep 2007.

Ohio State University, Center for Cognitive Sciences. COGFEST Lecture, May 2007.

Perceptual Expertise Network (PEN) Workshop XII, May 2006.

Rensselaer Polytechnic Institute, Troy, NY, Cognitive Science Department, Jan 2006.

Ohio State University, Columbus, OH, Department of Psychology, Dec 2005.

Ohio University, Athens, OH, Department of Psychology, Dec 2005.

University of Memphis, Memphis, TN, Department of Psychology, Dec 2005.

University of Colorado, Boulder, Computational Cognitive Neuroscience Lab, Oct 2005.

University of Colorado, Boulder, Computational Cognitive Neuroscience Lab, Sep 2005.

Carnegie Mellon University, Center for the Neural Basis of Cognition, Sep 2005.

University of California Irvine, Department of Psychology, June 2005.
University of Arizona, Tucson, Department of Psychology, Jan 2005.
University of Colorado, Boulder, Department of Psychology, Dec 2004.
University of California Irvine, Department of Psychology, Feb 2003.
Bulgarian Society for Cognitive Science, Research colloquium, Sep 2002.
Carnegie Mellon University, Seminar of the ACT-R research group, May 2001.
Carnegie Mellon University, Center for the Neural Basis of Cognition, Feb 2001.
New Bulgarian University, Department of Cognitive Science, July 2000.
University of Liège, Belgium, Cognitive science seminar, July 1996.
Hamburg University, Knowledge and Language Processing Research Group, June 1996.

Professional Service

Executive Committee member for the Center for Cognitive and Brain Sciences (CCBS, http://cog.osu.edu/) at Ohio State University (2015-present).

Consulting editor for *Psychological Review* (2015-present).

Program Committee member for *Cognitive Science Conference (2008, 2010, 2011)*.

Program Committee member for *Midwestern Cognitive Science Conference (2013)*.

Ad hoc reviewer for:

Acta Psychologica
Behavioral and Brain Sciences
Cognitive Psychology
Cognitive Science
Cognition
European Journal of Neuroscience
Journal of Cognitive Science Research
J Experimental Psychology: General
JEP: Human Perception and Performance
Journal of Mathematical Psychology
Journal of Neuroscience
Journal of Vision
Learning & Motivation
Memory & Cognition
National Science Foundation
Oxford University Press
(Attention,) Perception & Psychophysics
Philosophical Psychology
PLOS ONE
Psychological Review
Psychonomic Bulletin & Review
Science
Vision Research
Visual Cognition
Wiley-Blackwell Publishing
Cognitive Science Conference
International Conference on Cognitive Modeling.

Moderator of numerous spoken sessions at various conferences.

I organized a special spoken session on "Applications of Reaction-Time Models" at the *2010 Annual Meeting of the Psychonomic Society*, Nov 2010.

I organized a symposium on "Models of perceptual learning: Combining psychophysics, computation and neuroscience" at the *2011 Annual Meeting of the Vision Sciences Society*, May 2011. http://www.journalofvision.org/content/11/11/6

Advisees

M.Sc. Thesis Committee Member for Radu Luchianov, July 2000, New Bulgarian Univ.

M.Sc. Thesis Committee Member for Mariya M. Popova, July 2007, New Bulgarian Univ.
M.Sc. Thesis Committee Member for Jeffrey DeVries, Nov 2007, Ohio State University
Ph.D. Thesis Committee Member for James Christensen, Aug 2008, Ohio State University
General Exam Committee Member for Corey White, Dec 2008, Ohio State University
M.Sc. Thesis Committee Member for Kevin Guckes, Aug 2009, Ohio State University
General Exam Committee Member for Frank Kanayet, May 2010, Ohio State University
Ph.D. Thesis Committee Member for Corey White, May 2010, Ohio State University
Ph.D. Thesis Committee Member for Danelle Wilbraham, June 2010, Ohio State Univ.
Advisor of graduate student Gary Yim for his Interdisciplinary Cognitive-Science Summer Research Project, May-Nov 2010, Ohio State University
M.Sc. Thesis Committee Member for Eric Egan, Nov 2010, Ohio State University
Advisor of undergrad student Jordan Meyer for his Independent Study, 2010-2012, OSU.
Advisor of grad. student Alexander Roberts for his Independent Study, Winter 2011,OSU.
M.Sc. Thesis Advisor for Taylor Hayes, Winter 2011, Ohio State University
M.Sc. Thesis Advisor for Nicholas Van Horn, Spring 2011, Ohio State University
General Exam Committee Chair for Taylor Hayes, Winter 2012, Ohio State University
General Exam Committee Chair for Nicholas Van Horn, Summer 2012, Ohio State Univ.
General Exam Committee Member for Eric Egan, Summer 2012, Ohio State University
General Exam Committee Member for Gary Yim, Summer 2012, Ohio State University
M.Sc. Thesis Committee Member for Vishnu Sreekumar, Nov 2012,Ohio State University
M.Sc. Thesis Committee Member for Eric Weismantel, Aug 2013, Ohio State University
General Exam Committee Member for Vishnu Sreekumar, April 2014, Ohio State Univ.
Ph.D. Thesis Advisor for Nicholas Van Horn, August 2014, Ohio State University
Ph.D. Thesis Advisor for Taylor Hayes, November 2014, Ohio State University
M.Sc. Thesis Committee Member for Emanuele Rizzi, Dec 2014, Oho State University
M.Sc. Thesis Committee Member for Charlette Lin, April 2015, Oho State University
Ph.D. Thesis Committee Member for Vishnu Sreekumar, Nov 2015, Ohio State Univ.
M.Sc. Thesis Advisor for Ying Yu, July 2017, Ohio State University

Professional Affiliations

Cognitive Science Society
The Psychonomic Society
Society for Mathematical Psychology
Society for Philosophy and Psychology (SPP)
Vision Sciences Society (VSS)