

Course Schedule

The seminar will focus on the variety of ways researchers in various fields are creating models of human learning and performance across a variety of task situations. Guest speakers will come from several subfields with the assumption being that the complexity of human learning is such that it needs examination from multiple viewpoint including cognitive, neurobiological, perceptual, and behavioral approaches. The seminar will explore computational/mathematical models of learning, physiological models of learning, and theoretical models of learning.

16 JAN, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Pavlik- “A Taxonomy of Models of Human Learning”

- Anderson, J. R., Reder, L. M., & Simon, H. A. (1996). Situated Learning and Education. *Educational Researcher*, 25(4), 5–11. <https://doi.org/10.3102/0013189X025004005>
- Koedinger, K. R., Yudelson, M. V. and Pavlik, P. I. (2016), Testing Theories of Transfer Using Error Rate Learning Curves. *Top Cogn Sci*, 8: 589-609. doi:[10.1111/tops.12208](https://doi.org/10.1111/tops.12208)

23 JAN, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Pavlik- “Tracing Knowledge Development to Make Instructional Decisions”

- Pavlik Jr., P. I., Cen, H., & Koedinger, K. R. (2009). Performance factors analysis -- A new alternative to knowledge tracing. In V. Dimitrova, R. Mizoguchi, B. d. Boulay, & A. Graesser (Eds.), *Proceedings of the 14th International Conference on Artificial Intelligence in Education* (pp. 531–538). Brighton, England.
- Pavlik Jr., P. I., Brawner, K. W., Olney, A., & Mitrovic, A. (2013). A Review of Learner Models Used in Intelligent Tutoring Systems In R. A. Sottolare, A. Graesser, X. Hu, & H. K. Holden (Eds.), *Design Recommendations for Adaptive Intelligent Tutoring Systems: Learner Modeling* (Vol. 1, pp. 39-68). Army Research Labs/ University of Memphis.

30 JAN, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Huette - “Are connectionist models and embodiment compatible?”

- Kiela, D. (2017). *Deep embodiment: grounding semantics in perceptual modalities* (No. UCAM-CL-TR-899). University of Cambridge, Computer Laboratory. ([read chapters 1 and 2](#))
- Huette, S., & Anderson, S. (2012). Negation without symbols: The importance of recurrence and context in linguistic negation. *Journal of integrative neuroscience*, 11(03), 295-312.
- Thiessen, E. D., & Pavlik Jr., P. I. (2013). iMinerva: A Mathematical Model of Distributional Statistical Learning. *Cognitive Science*, 37(2), 310-343.

6 FEB, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Kugele – “Learning in LIDA”

- Franklin, S., Madl, T., Strain, S., Faghihi, U., Dong, D., Kugele, S., Snaider, J., Agrawal, P., Chen, S. (2016). A LIDA cognitive model tutorial. *Biologically Inspired Cognitive Architectures*, 105-130. doi: 10.1016/j.bica.2016.04.003 ([Sections 1, 2, 3, 4.1 through 4.11, 5, 6, 7.4](#))
- Newell, A. (1973). You can't play 20 questions with nature and win: Projective comments on the papers of this symposium. In W. G. Chase (Ed.), *Visual Information Processing*. New York: Academic Press.

13 FEB, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Simon - “Reward prediction error signals in the brain”

- Schultz W. (2016). Dopamine reward prediction error coding. *Dialogues in clinical neuroscience*, 18(1), 23-32.
- Buzsaki, G., & Moser, E. I. (2013). Memory, navigation and theta rhythm in the hippocampal-entorhinal system. *Nat Neurosci*, 16(2), 130-138.

20 FEB, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Morrison – "A Biocultural Model of Human Learning"

- Caro, T. M., & Hauser, M. D. (1992). Is there teaching in nonhuman animals?. *Quarterly Review of Biology*, 151-174.
- Gärdenfors, P., Högberg, A., Donald, M., Haidle, M. N., Gärdenfors, P., & Högberg, A. (2017). The archaeology of teaching and the evolution of Homo docens. *Current Anthropology*, 58(2), 000-000.

27 FEB, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Nokes – "Investigating student motivation, learning, and transfer"

- Nokes-Malach, T. J., & Mestre, J. P. (2013). Toward a Model of Transfer as Sense-Making. *Educational Psychologist*, 48(3), 184-207.
- Nokes-Malach, T. J., & Richey, J. E. (2015). Knowledge transfer: New approaches to a controversial phenomenon. In R. Scott and S. Kosslyn (Eds.), *Emerging Trends in the Social and Behavioral Sciences*. Hoboken, NJ: John Wiley and Sons.
- Barnett, S. M., & Ceci, S. J. (2002). When and where do we apply what we learn?: A taxonomy for far transfer. *Psychological Bulletin*, 128(4), 612-637.

13 MAR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Eglinton – "How learner heterogeneity can influence learner model interpretability"

- Yarkoni, T., & Westfall, J. (2017). Choosing Prediction Over Explanation in Psychology: Lessons From Machine Learning. *Perspectives on Psychological Science*, 12(6), 1100-1122.
- Pelánek, R. (2017). Bayesian knowledge tracing, logistic models, and beyond: an overview of learner modeling techniques. *User Modeling and User-Adapted Interaction*, 27(3), 313-350. ([first 10 pages](#))
- Pintrich, P. R. (2004). A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students. *Educational Psychology Review*, 16(4), 385-407.

20 MAR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Mozer - "Boosting inductive learning of visual concepts"

- Lindsey, R., Mozer, M. C., Huggins, W. J., & Pashler, H. (2013). Optimizing instructional policies. In C.J.C. Burges et al. (Eds.), *Advances in Neural Information Processing Systems 26* (pp.2778-2786). La Jolla, CA: Curran Associates, Inc.
- Roads, B. D., & Mozer, M. C. (2019). Predicting the ease of human category learning using radial basis function networks. Submitted for publication.

27 MAR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Braasch – "The discrepancy-induced source comprehension (D-ISC) model: basic assumptions and preliminary evidence"

- Braasch, J. L., Rouet, J. F., Vibert, N., & Britt, M. A. (2012). Readers' use of source information in text comprehension. *Memory & Cognition*, 40(3), 450-465.
- Braasch, J. L., & Bråten, I. (2017). The discrepancy-induced source comprehension (D-ISC) model: Basic assumptions and preliminary evidence. *Educational Psychologist*, 52(3), 167-181.
- Myers, J. L., & O'Brien, E. J. (1998). Accessing the discourse representation during reading. *Discourse Processes*, 26(2-3), 131-157.

3 APR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Meindl – "A behavior analytic approach to human learning and behavior"

- Delprato, D. J., & Midgley, B. D. (1992). Some fundamentals of B. F. Skinner's behaviorism. *American Psychologist*, 47(11), 1507-1520. <http://dx.doi.org/10.1037/0003-066X.47.11.1507>
- Stahlman, W. D., & Leising, K. J. (2018). The coelacanth still lives: Bringing selection back to the fore in a science of behavior. *American Psychologist*, 73(7), 918-929. <http://dx.doi.org/10.1037/amp0000261>

10 APR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Ritter – “Opportunities and barriers to school use of adaptive learning”

- Ritter, S., Yudelson, M., Fancsali, S. E., & Berman, S. R. (2016). *How Mastery Learning Works at Scale*. Paper presented at the Proceedings of the Third (2016) ACM Conference on Learning @ Scale, Edinburgh, Scotland, UK.
- Fancsali, S. E., Zheng, G., Tan, Y., Ritter, S., Berman, S. R., & Galyardt, A. (2018). *Using embedded formative assessment to predict state summative test scores*. Paper presented at the Proceedings of the 8th International Conference on Learning Analytics and Knowledge, Sydney, New South Wales, Australia.

17 APR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Olney

- Chi, M. T., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist*, 49(4), 219-243.
- Olney, A. M. (2018). The unreasonable effectiveness of AutoTutor. In K. K. Millis, D. Long, J. Magliano, & K. Wiemer (Eds.), *Deep Comprehension: Multi-Disciplinary Approaches to Understanding, Enhancing, and Measuring Comprehension*. New York: Routledge.
- McRae, K., & Jones, M. N. (2013). Semantic Memory, *The Oxford Handbook of Cognitive Psychology*.

24 APR, WED 2:30 – 5:30pm Cog Sci Seminar Spring 2019 – Pavlik