
Table 1

Computational Models of Rat Spatial Behavior

Number Authors

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| 1 | Balakrishnan, Bhatt, & Honavar (1998) Balakrishnan, Bousquet, & Honavar (1999) |
| 2 | Benhamou, Sauvé, & Poucet (1990) |
| 3 | Benhamou (1994) |
| 4 | Benhamou, Bovet, & Poucet (1995) |
| 5 | Berkeley, Prince, & Gunay (1999) |
| 6 | Blum & Abbott (1996) |
| 7 | Brown & Sharp (1995) |
| 8 | Burgess, O'Keefe, & Recce (1993) Burgess, Recce, & O'Keefe (1994) |
| 9 | Denham & Denham (1999) |
| 10 | Guazzelli, Bota, Corbacho, & Arbib (1998) |
| 11 | Neath & Capaldi (1996) |
| 12 | Neven & Schoner (1994) |
| 13 | Prescott (1996) |
| 14 | Schmajuk (1990) Schmajuk, Thieme, & Blair (1993) Schmajuk (1997) Schmajuk & Buhusi (1997) |
| 15 | Shapiro & Hetherington (1993) Hetherington & Shapiro (1993) |
| 16 | Sharp (1991) |
| 17 | Smart & Hallam (1994) |
| 18 | Touretzky, Wan, & Redish (1994) Touretzky & Redish (1996) Redish (1997) Redish (1999) |
| 19 | Trullier & Meyer (1998) |
| 20 | Tsodyks, Skaggs, Sejnowski, & McNaughton (1996) |
| 21 | Werbos & Pang (1996) |
| 22 | Worden (1992) |
| 23 | Zipser (1985) |
| 24 | Zipser (1986) |

REFERENCES

- Balakrishnan, K., Bhatt, R., & Honavar, V. (1998). A computational model of rodent spatial learning and some behavioral experiments. In M. A. Gernsbacher & Sharon J. Derry (Eds.). Proceedings of the Twentieth Annual Meeting of the Cognitive Science Society. Mahwah, NJ: Lawrence Erlbaum Assoc.
- Balakrishnan, K., Bousquet, O., & Honavar, V. (1999). Spatial learning and localization in rodents: A computational model of the hippocampus and its implications for mobile robots. Adaptive Behavior, *7*, 173-216.
- Benhamou, S. (1994). Spatial memory and searching efficiency. Animal Behaviour, *47*, 1423-1433.
- Benhamou, S., Bovet, P., & Poucet, B. (1995). A model for place navigation in mammals. Journal of Theoretical Biology, *173*, 163-178.
- Benhamou, S., Sauvé, J. P., & Bovet, P. (1990). Spatial memory in large scale movements: Efficiency and limitation of the egocentric coding process. Journal of Theoretical Biology, *145*, 1-12.
- Berkeley, I. S. N., Prince, C., & Gunay, C. (1999). RATNET: Exploring rat navigation with artificial neural networks. Paper presented at the 1999 Southern Society for Philosophy and Psychology Meeting in Louisville, Kentucky.
- Blum, K. I. & Abbott, L. F. (1996). A model of spatial map formation in the hippocampus of the rat. Neural Computation, *8*, 85-93.
- Brown, M. A. & Sharp, P. E. (1995). Simulation of spatial learning in the morris water maze by a neural network model of the hippocampal formation and nucleus accumbens. Hippocampus, *5*, 171-188.
- Burgess, N., O'Keefe, J., & Recce, M. (1993). In S. J. Hanson, C. L. Giles, & J. D. Cowan (Eds.), Advances in Neural Information Processing Systems 5 (pp. 929-936). San Mateo, CA: Morgan Kaufmann.
- Burgess, N., Recce, M., & O'Keefe, J. (1994). A model of hippocampal function. Neural Networks, *7*, 1065-1081.
- Denham, M. J. & Denham, S. L. (1999). Predictive information processing in the septal-hippocampal region and its involvement in learning and memory. American Association for Artificial Intelligence Workshop on Computation with Neural Systems, 12-18. AAAI Press Technical Report WS-99-04.
- Guazzelli, A. Bota, M., Corbacho, F. J., & Arbib, M. A. (1998). Affordances, motivations, and the world graph theory. Adaptive Behavior, *6*, 435-471.

Hetherington, P. A. & Shapiro, M. L. (1993). A simple network model simulates hippocampal place fields: II. Computing goal-directed trajectories and memory fields. Behavioral Neuroscience, 107, 434-443.

Neath, I. & Capaldi, E. J. (1996). A “random-walk” simulation model of multiple-pattern learning in a radial-arm maze. Animal Learning and Behavior, 24, 206-210.

Neven, H. & Schoner, G. (1994). Approximative vision and lowdimensional neural dynamics for ratlike robot navigation. Poster presented at Artificial Life IV: The Fourth International Workshop on the Synthesis and Simulation of Living Systems, July 7, 1994.

Prescott, T. J. (1996). Spatial representation for navigation in animats. Adaptive Behavior, 4, 85-123.

Redish, A. D. (1997). Beyond the Cognitive Map: Contributions to a Computational Theory of Rodent Navigation. Unpublished doctoral dissertation, Carnegie Mellon University.

Redish, A. D. (1999). Beyond the Cognitive Map: From Place Cells to Episodic Memory. Cambridge, MA: MIT Press.

Schmajuk, N. A. (1990). Role of the hippocampus in temporal and spatial navigation: An adaptive neural network. Behavioural Brain Research, 39, 205-229.

Schmajuk, N. A. (1997). Animal Learning and Cognition: A Neural Network Approach. New York, NY: Cambridge University Press.

Schmajuk, N. A. & Buhusi, C. V. (1997). Spatial and temporal cognitive mapping: A neural network approach. Trends in Cognitive Sciences, 1, 109-114.

Schmajuk, N. A., Thieme, A. D., & Blair, H. T. (1993). Maps, routes, and the hippocampus: A neural network approach. Hippocampus, 3, 387-400.

Shapiro, M. L. & Hetherington, P. H. (1993). A simple network model simulates hippocampal place fields: Parametric analyses and physiological predictions. Behavioral Neuroscience, 107, 34-50.

Sharp, P. E. (1991). Computer simulation of hippocampal place cells. Psychobiology, 19, 103-115.

Smart, W. D. & Hallam, J. (1994). Location recognition in rats and robots. In D. Cliff, P. Husbands, J.-A. Meyer, & S. W. Wilson (Eds.). Proceedings of the Third International Conference on Simulation of Adaptive Behavior: From Animals to Animats 3 (pp. 174-178). Cambridge, MA: MIT Press.

Touretzky, D. S. & Redish, A. D. (1996). Theory of rodent navigation based on interacting representations of space. Hippocampus, 6, 247-270.

Touretzky, D. S., Wan, H. S., & Redish, A. D. (1994). Neural representation of space in rats and robots. In J. M. Zurada & R. J. Marks (Eds.), Computational Intelligence: Imitating Life. Proceedings of the symposium held at the 1994 IEEE World Congress on Computational Intelligence. IEEE Press.

Trullier, O. & Meyer, J.-A. (1998). Animat navigation using a cognitive graph. In R. Pfeifer, B. Blumberg, J.-A. Meyer, & S. W. Wilson (Eds.), From Animals to Animats 5 (pp. 213-222). Cambridge, MA: MIT Press.

Tsodyks, M. V., Skaggs, W. E., Sejnowski, T. J., & McNaughton, B. L. (1996). Population dynamics and theta rhythm phase precession of hippocampal place cell firing: A spiking neuron model. Hippocampus, 6, 271-280.

Werbos, P. J. & Pang, X. (1996). Generalized maze navigation: SRN critics solve what feedforward or hebbian nets cannot. Proceedings of the World Congress on Neural Networks (pp. 88-93). Conference held in San Diego, California, September 15-18. Mahway, NJ: Lawrence Erlbaum, Inc.

Worden, R. (1992). Navigation by fragment fitting: A theory of hippocampal function. Hippocampus, 2, 165-188.

Zipser, D. (1985). A computational model of hippocampal place fields. Behavioral Neuroscience, 99, 1006-1018.

Zipser, D. (1986). Biologically plausible models of place recognition and goal location. In D. E. Rumelhart & J. L. McClelland (Eds.), Parallel Distributed Processing: Explorations in the Microstructure of Cognition. Volume 2: Psychological and Biological Models (pp. 432-470). Cambridge, MA: MIT Press.