

### **Group 3: Project 4**

1) Implement the Kalman filter model described by Körding et al. (2007) and show that it reproduces the spacing effect (Figure 4).

2) Hippocampal lesions often produce a temporal gradient of retrograde amnesia (Wixted, 2004). Can the Kalman filter model reproduce this if you “lesion” the short time-scale representation?

3) Standard consolidation theory assumes that memories grow weaker with time. By contrast, temporal distinctiveness theories assume that memories grow weaker due to interference (i.e., memories studied at nearby points in time interfere with retrieval). Experiments by Ecker et al. (2015) provide behavioral evidence for this prediction. Can the Kalman filter model account for these data?

### **References:**

Ecker, U.K.H., Brown, G.D.A., & Lewandowsky, S. (2015). Memory without consolidation: Temporal distinctiveness explains retroactive interference. *Cognitive Science*, 39, 1570-1593.

Körding, K.P., Tenenbaum, J.B., & Shadmehr, R. (2007). The dynamics of memory as a consequence of optimal adaptation to a changing body. *Nature Neuroscience* 10, 779–86.

Wixted, J.T. (2004). The psychology and neuroscience of forgetting. *Annual Review of Psychology*, 55, 235–269.