BGGN 246: Computational Neurobiology

23 Problems in Systems Neuroscience, Leo van Hemmen and Terrence Sejnowski (Eds), Oxford University Press, 2006

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Wednesday, January 13:
Chapter 4, Murray Sherman: “What is the function of the thalamus?” - Tiger Lin
Chapter 6, Jean Bullier: “What is the role of top-down connections?” - Samat Moldakarimov

Thursday, January 21:
Chapter 19, Terry Sejnowski: "What are the projective fields of cortical neurons?" – Christian Wehrhahn
Chapter 23, Francis Crick and Christof Koch: What are the neural correlates of consciousness?” – Maxime Bonjean

Wednesday, January 27:
Chapter 16, Laurenz Wiskott: “How does our visual system achieve shift and size invariance?” – Ben Huh
Chapter 20, John Reynolds: “To what extent is the brain reconfigurable?” – Ben Regner
**Wednesday, February 3:**
Chapter 2, Hermann Wagner and Bernhard Gaese: "Can we understand the action of brain in natural environments?" - **Marcus Plank**

Chapter 3, Gunter Ehret: "Hemisphere dominance of brain function - which functions are lateralized and why?" - **Ben Cipollini**

**Wednesday, February 10:**
Chapter 12. Catherine Carr et al.: "Are neurons adapted for specific computations? Examples from temporal coding in the auditory system" - **Sophie Liu**

Chapter 13. Andreas Herz: "How is time represented in the brain?" - **Doug Yovanovich**

**Thursday, February 18:**
Chapter 5. Leo Van Hemmen: “What is a neuronal map, how does it arise, and what is it good for?” - **Aleena Garner**

Chapter 10. Bruno Olshausen and David Field: “What is the other 85% of V1 doing?” – **Zhilin Zhang**

**Wednesday, March 3:**
Chapter 13. Andreas Herz: "How is time represented in the brain?" – **Doug Yovanovich**

Chapter 18. Giacomo Rizzolatte and Vittoria Gallese: "To what extent does perception depend upon action?" – **He Huang**
Wednesday, March 10:
Chapter 14. David McAlpine and Alan Palmer: “How common are neural codes?” Jake Olson

Thursday, March 18:
Chapter 7. Wulfram Gerstner: “How fast is neuronal signal transmission?” – Peter Li
Chapter 9. Tal Kenet, Aos Arieli, Misha Tsodyks, Amiram Grinvald: “Are single cortical neurons independent or are they obedient members of a huge orchestra?” - Tim Mullen
2010 Cosyne poster: Canolty et al, Single-neuron spike timing depends on global brain dynamics
Chapter 1, "Shall we even understand the fly's brain?"
Chapter 2, "Can we understand the action of brain in natural environments?" - Marcus Plank
Chapter 3, "Hemisphere dominance of brain function - which functions are lateralized and why?" - Ben Cipollini
Chapter 4, “What is the function of the thalamus?” - Tiger Lin
Chapter 5. “What is a neuronal map, how does it arise, and what is it good for?” – Aleena Garner
Chapter 6, “What is the role of top-down connections?” - Samat Moldakarimov
Chapter 7. “How fast is neuronal signal transmission?” – Peter Li
Chapter 8. "What is the origin and functional properties of irregular activity?" – Adam Calhoun
Chapter 9. “Are single cortical neurons independent or are they obedient members of a huge orchestra?” - Tim Mullen
Chapter 10. “What is the other 85% of V1 doing?” – Zhilin Zhang
Chapter 11. “What is the Formal Computation in Early Vision?”
Chapter 12. “Are neurons adapted for specific computations? Examples from temporal coding in the auditory system” Sophie Liu
Chapter 13. "How can neural systems compute in the time domain?" – Doug Yovanovich
Chapter 14. “How common are neural codes?” – Jake Olson
Chapter 15. “How does the hearing system perform auditory scene analysis?”
Chapter 16. “How does our visual system achieve shift and size invariance?” – Ben Huh
Chapter 17. What is reflected in sensory neocortical activity: External stimuli or what the cortex does with them?”
Chapter 18. "To what extent does perception depend upon action?" – He Huang
Chapter 19. “What are the projective fields of cortical neurons?” – Christian Wehrhahn
Chapter 20. “To what extent is the brain reconfigurable?” – Ben Regner
Chapter 21. "Where are the switches on this thing?" –
Chapter 22. "Do qualia, metaphor, language and abstract thought emerge from synesthesia?"
Chapter 23. What are the neural correlates of consciousness?” - Maxime Bonjean