

Chapter VII Neurobiologically plausible computational models

VII.1. Why bother with computational models?

(Abbott 1994, Abbott 2005, Abbott 2008, Attneave 1954, Bertero & Poggio 1988, Blake 1989, Brincat & Connor 2006, Burbank & Kreiman 2012, Carandini et al 2005, Carandini et al 1997, Feynman 1963, Fukushima 1980, Hertz et al 1991, Hubel & Wiesel 1962, Keat et al 2001, Koch & Laurent 1999, Laurent 2002, Poggio 1990, Poggio et al 1985, Prinz AA 2004, Sejnowski et al 1988, Serre et al 2007, Tegmark 2014)

VII.2. Models of single neurons

(Carandini & Heeger 1994, Gabbiani & Cox 2010, Hodgkin & Huxley 1952, Hubel & Wiesel 1968, Koch 1999, Lopicque 1907, McCulloch & Pitts 1943)(Gerstner & Naud 2009, Gold et al 2006, Herz et al 2006, Hodgkin & Huxley 1952, Izhikevich 2003, Koch 1999, Koch & Segev 1989, Koch & Segev 2000)

VII.3. Network models

(Borges 1951, Carandini et al 1997, Carpenter & Grossberg 2002, Fukushima 1980, Heeger et al 1996, Hopfield 1982, Hopfield 1995, Kenet et al 2003, McClelland & Rumelhart 1981, McClelland et al 1986, Olshausen et al 1993, Ostojic & Brunel 2011, Riesenhuber & Poggio 1999)

VII.4. Firing rate network models

(Adelson & Bergen 1985, Dayan & Abbott 2001, Miller 1996, Miller 2003, Miller 2016)

VII.5. The convolution operation

VII.6. Hopfield networks

(Hopfield 1982, Tank & Hopfield 1987)

VII.7. Neural networks can solve vision problems

(Krizhevsky et al 2012, LeCun et al 1998)

VII.8. Extreme biological realism: the “blue brain” project

(Markram 2006, Reimann et al 2013)

VII.9. References

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