

## Condensed Matter &gt; Disordered Systems and Neural Networks

# Towards Google matrix of brain

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We apply the approach of the Google matrix, used in computer science and World Wide Web, to description of properties of neuronal networks. The Google matrix  $\mathbf{G}$  is constructed on the basis of neuronal network of a brain model discussed in PNAS 105, 3593 (2008). We show that the spectrum of eigenvalues of  $\mathbf{G}$  has a gapless structure with long living relaxation modes. The PageRank of the network becomes delocalized for certain values of the Google damping factor  $\alpha$ . The properties of other eigenstates are also analyzed. We discuss further parallels and similarities between the World Wide Web and neuronal networks.

Comments: revtex 5 pages, 6 figs, research at [this http URL](#)Subjects: **Disordered Systems and Neural Networks (cond-mat.dis-nn)**; Networking and Internet Architecture (cs.NI); Adaptation and Self-Organizing Systems (nlin.AO); Physics and Society (physics.soc-ph); Neurons and Cognition (q-bio.NC); Tissues and Organs (q-bio.TO)Cite as: **arXiv:1002.4583v1 [cond-mat.dis-nn]**

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